

The impact of decree laws on the performance of Turkish physiology academics: A repeated cross-sectional study

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Abstract

Objectives

This study aimed to describe the academic losses resulting from the Turkish purge and associated dismissals with the decree laws following the failed coup attempt in 2016 concerning physiology academics.

Methods

An observational study was conducted covering the time before 2008, 2009–2012, 2013–2016, and 2017–2020. All actively-working assistant, associate, and full professors of physiology in Turkey as of 15th July 2016 and recently hired academic staff after the coup attempt in 2016 were included in the study. Data collection was performed in December 2020. The primary outcome variable of the study was the total number of publications listed in Google Scholar.

Results

Data of 271 academics were analyzed. Of the participants, 209 (87.1%) continued on their positions, 31 (12.9%) were dismissed after the 2016 coup attempt, and 31 were hired after the purge. The number of publications of scholars hired before 2016 and dismissed were significantly higher before 2008, between 2009 and 2012, and between 2013 and 2016 compared to scholars hired before 2016 and not purged ($p < 0.05$). Also, the total number of citations, H-index, and i10-index values were significantly better in the purged individuals ($p < 0.05$). Although the purged academics had relatively higher performance indicators in the previous years, they experienced a 44.2% loss in the number of publications after 2016.

Conclusion

The mass dismissals after the coup attempt in 2016 harmed individual physiology academics as well as the general physiology academy. International academic and human rights organizations must be more sensitive to protect scholars who undergo similar persecutions.

Introduction

Background/rationale

Turkey experienced a failed coup attempt on the 15th July 2016. Starting one week after the coup attempt, decree laws were issued to dismiss state employees [1]. Until November 2019, 559 064 people underwent some procedural acts [2]. A striking feature of these people is their educational levels; around

99% have some university degree [3]. The total number of expelled state employees is reported as 125 678 [4], of which 7 236 were academic staff and 1 148 were academic staff at medical schools.

Science productivity is considered as an indicator of development. Turkey had an increasing trend in citation share until 2009 [5]. The numbers as well as quality of scientific publications have increased over the years. However, although Turkey increased its research and development expenditure from 0.54% of gross domestic product (GDP) in 2001 to 0.86% in 2011, this amount is still behind the developed countries [6]. On the other hand, both the total number of publications and total number of articles addressed from Turkey decreased the year after the coup attempt in July 2016 (from 39 047 to 35 547, 8.9% decline, and from 30 501 to 28 714, 5.8% decline, respectively) [7]. Given the approximately 6.5% increasing trend of the publications in the previous years, this decline deserves attention.

Around 250 physiology academics were employed in Turkey before the coup attempt. In this study, we decided to investigate the aftereffects of the decree laws on academic physiology in more detail. We hypothesized that the number of dismissed physiology academics is proportional to the total number of dismissals, and the scientific production speed was decreased. Despite the immediate academic losses with the decree laws, new positions were opened and filled with young, and, thus, less experienced staff. Furthermore, the purged academics were not allowed to re-apply to official posts. As a result, even some private sector job ads mentioned that purged academics are not wanted [8, 9].

Objectives

This study aimed to describe the academic losses resulting from the Turkish purge [10] and associated dismissals with the decree laws following the failed coup attempt in 2016. Thus, demonstrating the results of political interference with science. Two primary objectives of the study were to identify the personal losses of the dismissed physiology academics and to investigate the four-year impact of the purge to the general scientific production of Turkish physiology academics.

Methods

Study Design

A repeated cross-sectional study was conducted. The authors published a similar report about family physicians [11]. This investigation is an effort to describe the situation in another medical discipline. Since the study subjects were anonymized and data collection was based on public-domain sources, no ethical board approval was deemed necessary. Study reporting was done per the STROBE statement [12].

Participants

All actively-working assistant, associate, and full professors of physiology in Turkey as of 15th July 2016 and recently hired academic staff after the coup attempt in 2016 were included in the study. The list of purged participants was obtained by reviewing the 31 decree laws published during the emergency state period [13]. The majority of dismissals took place within the three months after the coup attempt. The list

of the actively working academic staff as of August 2020 was obtained manually by reviewing the websites of the 82 academic physiology institutions in Turkey.

Variables

The primary outcome variable of the study was the total number of publications listed in Google Scholar. Data collection was done during December 2020. Google Scholar search terms included the following format: "Name Surname." Data collection was done covering the time before 2008, 2009–2012, 2013–2016, and 2017–2020.

In case of multiple authors with the same name, the number of articles were manually counted by paying attention to the institutions and type of articles. Other variables included were age, sex (M/F), institute type (public/private), purge status (yes/no), academic title during the purge (assistant/associate/full prof.), hired after the purge (yes/no), H-index, and i10 index.

Bias

Publications were evaluated in four-year intervals. However, the publication process of an article takes an average of four months from the date of submission to the journal [14]. Although articles published during the second half of the year 2016 after the coup attempt were considered as scientific work submitted earlier, we can't confirm this assumption. All retrieved articles were double-checked visually by two authors for relevance to prevent similarities in author names. Women authors were checked for any change in the names after marriage.

Study Size

A post-hoc sample size calculation was performed using the main outcome variable 'total number of publications.' To compare three groups using the one-way ANOVA, a total sample size of 270 participants provides a comparison with an alpha error of 5%, an effect size of 0.19 (small - medium), and a power of 80% [15].

Statistical Methods

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 software (SPSS Inc., Chicago, IL, USA). The results were presented as frequencies, percentages, means, and standard deviations (SD). The Kolmogorov–Smirnov test was performed to test if the numerical variables were normally distributed. One-way ANOVA or the Kruskal-Wallis test with post-hoc Tamhane was applied to compare numerical variables between the three groups. The independent samples t-test or Mann-Whitney U test was used to compare numerical variables between two groups, and the Chi-Square test (or Fisher's exact test) was used for categorical variables. The Friedman test was applied to check for significant changes of the number of publications over time. Comparisons between two time points were made by the Wilcoxon test. A p-value of < 0.05 was considered as statistically significant.

Results

Participants

Data of 271 academic staff from 65 institutions were analyzed. Of the participants, 209 (87.1%) continued on their positions and 31 (12.9%) were dismissed with the decree laws after the 2016 coup attempt. On the other hand, 31 assistant professors were hired after the aforementioned incident.

Five of the institutions (1.8%) were private, while 266 (98.2%) were public-origin. Gender distributions within the study were 43.2% females (n = 117) and 56.8% (n = 154) males. The mean age (\pm SD) of the participants was 47.76 ± 8.43 years, ranging from 28 to 66 years.

Descriptive findings

The mean number of total publications during the three recent measurement periods demonstrated an increase of 29.6% from 2009–2012 to 2013–2016 period, while an increase of 5.1% was observed from 2013–2016 to 2017–2020 (Fig. 1).

Citation information were available for 129 academics. The mean (\pm SD) number of total citations, H-index, and i10-index were 741.61 ± 1185.49 , 11.94 ± 9.02 , and 16.68 ± 22.78 , respectively. Concerning the H-indexes, 21 (7.7%) academics had 20 or above values. Also, 33 participants (12.1%) had i10 indexes of 20 or above. Only 13 participants (4.7%) had i10 indexes of 40 and above. On the other hand, while there was one scholar with 8706 citations, most participants had less than 1000 total citations; only 26 scholars (9.5%) had a total of 1000 citations or more.

Outcomes

There were significant differences concerning the proportions of sex, academic title, and institute category between the dismissed academics and others. All five academics from private universities lost their job because their institutions were closed by decree laws (Table 1).

Table 1
Baseline characteristics of the participants compared between the groups (N = 271)

		Hired before 2016-Purged	Hired before 2016-Not purged	Hired after 2016	χ^2	p
Sex	Female	6 _a	96 _b	15 _b	8.161	0.017
		19.4%	45.9%	48.4%		
	Male	25 _a	113 _b	16 _b		
		80.6%	54.1%	51.6%		
Title	Assist. Prof.	6 _a	36 _a	27 _b	70.603	< 0.001
		19.4%	17.2%	87.1%		
	Assoc. Prof.	10 _a	58 _a	1 _b		
		32.3%	27.8%	3.2%		
	Prof.	15 _a	115 _a	3 _b		
		48.4%	55.0%	9.7%		
Institute Category	Public	26 _a	209 _b	31 _b	20.025*	< 0.001
		83.9%	100.0%	100.0%		
	Private	5 _a	0 _b	0 _b		
		16.1%	0.0%	0.0%		
*Fisher's exact test. Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the 0.05 level.						

The mean ages of the recently hired academics were significantly lower compared to the others. Also, there were significant differences in the mean total number of citations, H-index, i10-index, number of publications before 2008, number of publications between 2009–2012, number of publications between 2013–2016, number of publications between 2017–2020, and total number of publications between the groups (Table 2). Post-hoc comparisons demonstrated that most of the differences were caused by the recently hired academics. In general, the dismissed academics had better performance indicators than their non-dismissed peers. However, significant differences were observed concerning the mean number of total publications before 2008 (Tamhane $p = 0.021$) and publications between 2013–2016 (Tamhane $p = 0.030$).

Table 2
Comparison of the mean academic performance scores between the groups (N = 271)

	Group							
	Hired before 2016- dismissed		Hired before 2016- not dismissed		Hired after 2016		F/Z	p
	Mean	SD	Mean	SD	Mean	SD		
Age	47.77	7.70	48.89	8.22	40.19	6.65	15.937*	< 0.001
Total number of citations	1251.33	954.68	753.92	1240.62	67.00	107.43	2.986*	0.054
H-index	18.17	7.47	11.93	8.86	5.18	7.70	6.446*	0.002
i10-index	29.92	21.11	16.75	23.28	1.55	1.44	4.712*	0.011
Publications before 2008	37.81	39.69	16.83	23.85	1.71	3.93	44.343#	< 0.001
Publications between 2009–2012	32.58	48.00	13.01	25.26	1.65	4.10	56.317#	< 0.001
Publications between 2013–2016	42.06	46.24	18.83	26.03	4.32	6.23	43.673#	< 0.001
Publications between 2017–2020	23.48	28.03	22.45	26.33	7.55	9.48	19.713#	< 0.001
Total number of publications	135.94	143.09	71.11	90.17	15.23	16.39	52.263#	< 0.001
SD: Standard deviation. *One-way ANOVA, #Kruskal-Wallis test								

The number of publications of scholars hired before 2016 and dismissed were significantly higher before 2008, between 2009 and 2012, as well as between 2013 and 2016 compared to scholars hired before 2016 and not purged. On the other hand, this difference was not significant during the 2017–2020 period. Also, the total number of citations, H-index, and i10-index values were significantly better in the purged individuals (Table 3).

Table 3
Comparison of the scientific indices between the purged and non-purged groups

	Groups		Test	p
	Hired before 2016- purged	Hired before 2016-not purged		
Total number of citations (n 12/106)	1251.33±954.68	753.92±1240.61	2.903*	0.004
H-index (n 12/106)	18.17±7.46	11.93±8.86	2.341#	0.021
i10-index (n 12/106)	29.92±21.11	16.75±23.27	3.048*	0.002
Publications before 2008 (n 31/209)	37.81±39.69	16.83±23.84	3.625*	< 0.001
Publications between 2009–2012 (n 31/209)	32.58±48.00	13.01±25.25	4.541*	< 0.001
Publications between 2013–2016 (n 31/209)	42.06±46.23	18.83±26.02	3.502*	< 0.001
Publications between 2017–2020 (n 31/209)	23.48±28.02	22.45±26.32	0.535*	0.592
Total number of publications (n 31/209)	135.94±143.08	71.11±90.16	3.795*	< 0.001
Values represent mean±standard deviations. *Mann-Whitney U test, #Independent samples t-test,				

While there was a gradual increase in academic performance markers until 2016, a decline was observed afterwards in the dismissed academics. Also, despite a decrease after 2016, the purged academics had the highest number of publications compared to the other groups (Fig. 2). On the other hand, although the purged academics had relatively higher performance indicators in the previous years, they experienced a 44.2% loss (from 42.1 to 23.5) in the number of publications after 2016, while their peers had an increase of 19.1% (from 18.8 to 22.4) (Fig. 2).

Furthermore, low academic performance indices were observed in the recently hired academics. Their mean number of citations was 67.0. As a more substantial finding, there were four academics (3 non-purged and 1 recently hired) with no publications at all and 8 academics (5 non-purged and 3 recently hired) with only one publication indexed by Google Scholar.

Comparison of the repeated measures on 2009–2012, 2013–2016, and 2017–2020 demonstrated a significant change in the total number of publications over time (Friedman Test Chi-Square = 79.881, $p < 0.001$) (Fig. 2).

Compared to the non-purged peers, the purged individuals had significantly higher number of publications in the 2009–2012 and 2013–2016 periods (Mann-Whitney U Z; p , 4.541; < 0.001 and 3.502;

<0.001, respectively). However, the difference in the mean number of total publications in these two groups were not significant for the 2017–2020 period (Mann-Whitney U Z = 0.535, p = 0.592) (Fig. 2).

Further analysis of the data demonstrated a significant decline in the number of publications of the purged after 2016 (Wilcoxon Z = 3.391, p = 0.001), parallel to significant increases in the publications of the non-dismissed and recently hired group (Wilcoxon Z; p, 3.594; <0.001 and 2.303; 0.021, respectively) (Fig. 2).

Discussion

Key Findings

This study demonstrated a significant decline in the academic productivity indices of Turkish physiology academics following the decree laws after the coup attempt in 2016. The 29.6% increasing trend of the total publications from 2009–2012 to 2013–2016 slowed down to 5.1% from 2013–2016 to 2017–2020. The number of publications of scholars hired before 2016 and dismissed were significantly higher before 2008, between 2009 and 2012, as well as between 2013 and 2016 compared to scholars hired before 2016 and not purged. On the other hand, this difference was not significant during the 2017–2020 period. Also, the total number of citations, H-index, and i10-index values were significantly better in the purged individuals.

Limitations

This study relied on hits received from search terms of author names. Despite some limitations, Google Scholar is the commonplace search engine amongst all sectors of the academic community [16]. Although Google Scholar's coverage is wide-ranging, it is not comprehensive. Therefore, cross-validation by other academic sources such as Web of Science could provide more reliable data. Furthermore, manual inspection of all search results would have excluded erroneous matches and grey literature. On the other hand, beyond the number of publications, the order of author names would deliver useful data to speculate on the weight of contributions of the different academic groups.

Interpretations

As to 2019, the Turkish higher education was composed of 178 institutions, 158 097 academic staff, and 3 887 682 students [17]. Of the academic personnel, there were 28 858 professors, 16 761 associate professors, 41 670 assistant professors, and 70 808 other academic personnel [17, 18]. As a comparison, Germany, a country with a similar number of population, has 399 higher educational institutions and 385 311 academic staff [19]. With the dismissal of the 7 236 persons, Turkey lost around 4.5% (7 236/158 097) of the total number of academic staff.

On the other hand, the 12.9% (31/240) dismissal proportions of physiology academics is almost three times compared to the total purged academic staff. This percentage is similar to the 15.8% expelled

academic medical staff within the total purged state employees (1 148/7 236) [4]. It is evident that medical academic professionals are more affected from the dismissal process.

Worldwide, the number of scientific articles have an inclination to increase yearly about 3% [20]. Therefore, we consider that the slight decline in economic conditions of the country [21] may have only a small effect on the fall of academic productions. As stated in our previous study [11], the significant reduction in the increasing trend of scientific publications can be assumed to be the effects of emergency state in Turkey on academic performance.

Of the total academic employees in Turkey, 61.8% are males [22]. Our findings indicate that male dismissals are higher than their proportions in the academy. It can be speculated that males were seen as political threats by the government due to their gender as well as comparatively higher academic ranks.

H-index and i10 index values of the dismissed academics were significantly higher than their non-purged peers. H-indexes of the dismissed individuals were near to 20, which is suggested by Hirsch as a good level [23], while the non-dismissed academics had a mean H-index of 11.93. A successful scholar is expected to have an i10 index as high as his/her age [24]. Although our study demonstrated relatively low i10 indexes, the purged academics have better values. This information should be interpreted together with the data that around 99% of the purged individuals by the decree laws have some university degree [3].

Academic losses in the extent of Turkey purge are rare in human history. As a comparison, approximately 9 000 physicians were uprooted for racial or political reasons by the Nazi regime [25]. To our knowledge, neither local, nor international societies have commented or condemned the unlawful procedures against physiology academics or other academic staff in Turkey. However, organizations such as the SAR (www.scholarsatrisk.org), CARA (www.cara.ngo), SRF (www.scholarrescuefund.org), and PSI (www.humboldt-foundation.de) demonstrate enormous energy to assist scholars at risk [26].

The number of publications of purged academics decreased by 55.8% during the four years before (mean 42.06) and after (mean 23.48) their dismissals. In fact, most of these scholars were kept under custody, imprisoned, or went into exile. Thus, since most of these former academics are not able to function as scholars, a much steeper decline would be expected.

Conclusion

The mass dismissals after the coup attempt in 2016 harmed individual physiology academics as well as the general physiology academy. Academic performances of the dismissed academics deserve future follow up. Furthermore, local and international effort is needed to rehabilitate these scholars and incorporate them to the scientific world. As a last and most important conclusion, international academic and human rights organizations must be more sensitive to protect scholars who undergo similar persecutions.

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Competing Interests

The authors declare no competing interests.

Figures

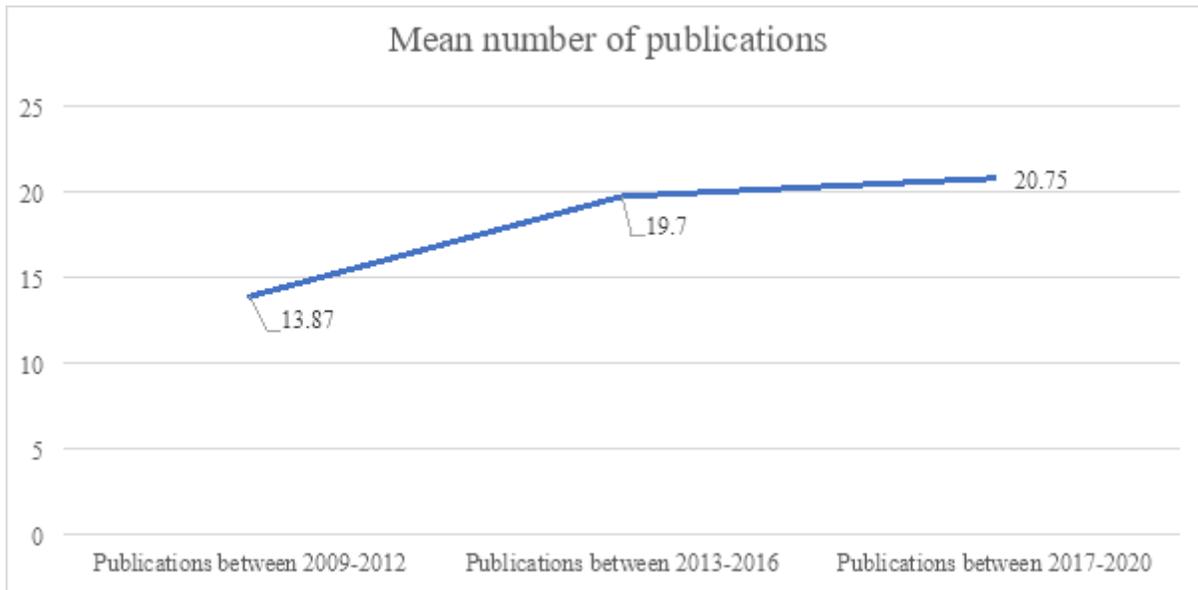


Figure 1

Total number of publications by physiology academics within four-year intervals

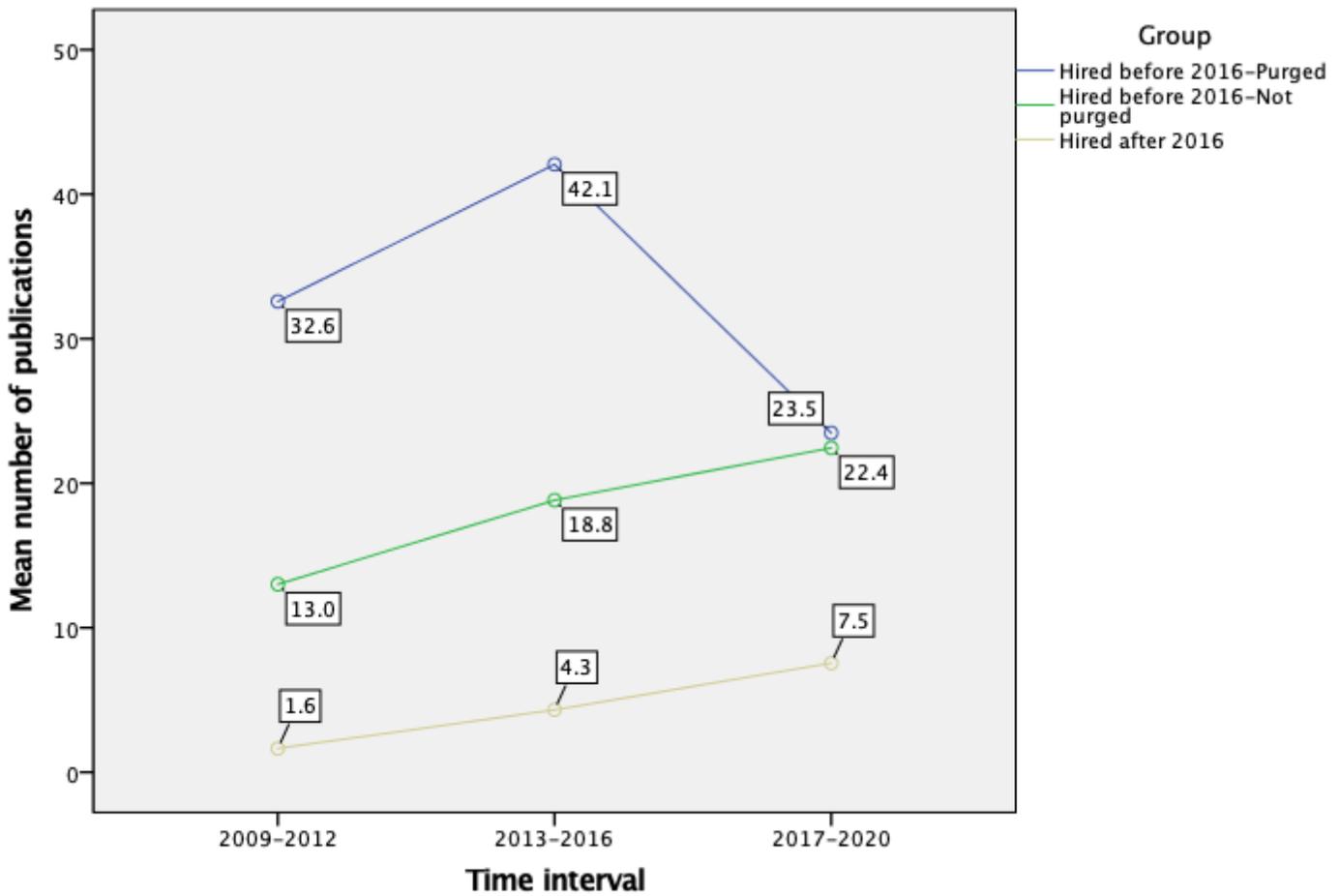


Figure 2

Comparison of the mean number of publications over time between the groups (N=271)