The impact of increased pharmacy schools on pharmacists' income: is it still an attractive profession?

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Abstract

Background Pharmacy education in South Korea transitioned from a 4-year to a 6-year program in 2011, alongside an increase in the number of pharmacy schools and students. The change in pharmacy education may have reduced the attractiveness of the profession, particularly in terms of income. This study aimed to assess the impact of the increasing number of pharmacy students on the income levels and distribution among owner pharmacists, staff pharmacists, and hospital pharmacists.

Methods This retrospective observational study used data from the Ministry of Health and Welfare to track pharmacists' annual income from 2010 to 2020. The income was categorized by sector, region, and gender. An interrupted time series analysis was conducted to estimate the effect of the increasing number of pharmacy students on pharmacists' income.

Results The income levels of pharmacists increased from 2010 to 2020, even after adjusting for inflation. By 2020, the income levels for owner pharmacists, staff pharmacists, hospital pharmacists reached 110 million, 58 million, and 51 million Korean won, respectively. The impact of increased pharmacy schools on the income of pharmacists varied by sector. The expansion led to a substantial increase in the income of owner pharmacists, while the incomes of staff pharmacists and hospital pharmacists showed no significant changes.

Conclusion Despite the increase in the number of pharmacists, the profession remains attractive in terms of both income level and its distribution, particularly for female pharmacists. However, this increase has had a more favorable impact on the income growth of owner pharmacists compared to staff and hospital pharmacists.

Keywords Pharmacy education, Pharmacy school, Pharmacists' income, South Korea

Introduction

Income is a crucial factor influencing career choices [1–3]. For pharmacists, income reflects a combination of factors, including human capital, individual preferences, and institutional influences [2–4]. Due to the standardized nature of pharmacy education and licensing

examinations, pharmacists generally possess similar levels of human capital [5], and their roles are often considered more interchangeable compared to those in other professions [6, 7]. Furthermore, a pharmacist's income is influenced by job-related factors, such as benefits, job location and accessibility, flexibility in working hours and schedules, and perceived stress levels [8–10]. Lastly, institutional factors affecting income include monopolistic structures, such as regulations governing pharmacy school admissions and licensing [11, 12].

In 2011, South Korea's pharmacy education underwent a major transformation [13–15]. The traditional

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4-year pharmacy education program was replaced by a 2 + 4-year system, designed to improve public health, strengthen the professional skills of pharmacists, and align pharmacy education with international standards [16, 17]. In addition, 15 new pharmacy schools were established, and admission quotas at several existing schools were expanded [13–15]. As a result, the number of pharmacy students increased by 40%, from 1,210 to 1,693. These changes aimed to place pharmacists not only for clinical settings but also for the pharmaceutical industry, a key driver of the national economy. The first graduates under this curriculum completed their studies in February 2015 [18].

The changes in pharmacy education may have reduced the attractiveness of the profession in several ways. First, the cost of acquiring human capital has increased [19, 20]. With the extension of the pharmacy education period to six years in South Korea, the duration of pharmacy training now matches that of medical education [21]. Consequently, the relative advantage of becoming a pharmacist, compared to becoming a doctor, has diminished in terms of time and cost. Second, the increase in the number of pharmacy students and pharmacists working in clinical settings may result in an oversupply [22, 23]. This is particularly concerning in South Korea, where most pharmacists focus on dispensing medications and selling over-the-counter (OTC) products in pharmacies [24, 25], making the profession vulnerable to oversupply.

As of February 2025, ten years have passed since the first group of newly trained pharmacists entered the workforce. During this period, approximately 16,000 graduates have completed their programs [13, 14], leading to significant changes in the number of pharmacists and the overall pharmacy market. However, no quantitative studies have been conducted to assess these changes. This study aims to evaluate the impact of the increase in pharmacy students on the income levels and distribution of owner pharmacists, staff pharmacists, and hospital pharmacists. The findings will provide critical insights for policymakers, educators, and healthcare stakeholders, informing decisions on pharmacy workforce planning, education policy, and strategies to maintain a balanced pharmacy labor market globally.

Methods

Study overview

This retrospective observational study tracked the level and distribution of pharmacists' income in South Korea from 2010 to 2020, with a particular focus on changes before and after the increase in pharmacy schools. The expansion of pharmacy schools led to a rise in the number of pharmacy students, with the first cohort graduating in February 2015. We obtained data on the aggregated annual income of pharmacists, categorized by sector, gender, and region. The sectors include owner pharmacists (pharmacists who own and operate individual pharmacies), staff pharmacists (those employed by owner pharmacists and working in these pharmacies), and hospital pharmacists (those working in hospitals). To assess income inequality across regions, we calculated the Gini coefficient, a statistical measure of income distribution ranging from 0 (perfect equality) to 1 (perfect inequality). Finally, we analyzed the income ratio of female pharmacists compared to their male counterparts to highlight gender-based income differences.

Data sources

The aggregated data on pharmacists' annual income were provided by the Ministry of Health and Welfare [26] and are available as an open access source, and contain no missing values. This data source includes the annual income of owner pharmacists, staff pharmacists, and hospital pharmacists, categorized by gender and region from 2010 to 2020. Pharmacists' income was calculated based on the monthly income used by the National Health Insurance Service for insurance premium assessments [27]. Business income was used to calculate the monthly income for owner pharmacists, while wage income was used for staff pharmacists and hospital pharmacists. The region was categorized into *Si* and *Do*. *Si* refer to urban areas in South Korea and includes 8 regions: Seoul, Busan, Daegu, Incheon, Kwangju, Daejeon, Ulsan, and Sejong. Do refer to rural areas in South Korea and includes 9 regions: Gyeonggi, Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.

Statistical analysis

Two types of analysis were employed in this study: descriptive analysis and interrupted time series analysis. Descriptive analysis was used to present the trends in the level and distribution of pharmacists' income from 2010 to 2020. The Consumer Price Index was used to adjust for inflation that could occur over the 11-year period [28]. The Gini coefficient for pharmacists' income across regions was calculated [29].

We fitted a segmented linear regression model to conduct the interrupted time series analysis, with the study period spanning from 2010 to 2020. The increased number of pharmacy students were expected to graduate and begin working as pharmacists in 2015, making 2015 the intervention year for this study. The coefficient of β_1, β_2, and β_3 are particularly noteworthy in the model [30]. β_1 represents the trends in income before the intervention. β_2 represents the immediate effect of the intervention. β_3 represents the change in the trend of income after the

intervention. The error term, ε_t, indicates deviation from the fitted model [31]. We conducted a Durbin-Watson test to detect the presence of autocorrelation in the error term [32]. If the test rejected the null hypothesis that true autocorrelation is zero, we applied ordinary least squares regression with Newey-West standard errors [33]. Data management and analysis were performed using R statistical software (version 4.3.1), with statistical significance set at a *p*-values threshold less than 0.05.

$$Yt = \beta_0 + \beta_1 t + \beta_2 Dt + \beta_3[t - T_I]\, D_t + \varepsilon_t$$

Y_t: the income of pharmacists; t: a continuous variable indicating the year that has passed from the start of the study period; D_t: a dummy variable indicating the pre-intervention period (0) or the post intervention period (1); T_I: a time when the intervention occurred.

Results

Trends in pharmacists' income

Figure 1 presents income trends of owner pharmacists, staff pharmacists, and hoispital pharmacists from 2010 to 2020. In particular, Figs. 1a and b present the actual and inflation-adjusted income of owner pharmacists, staff pharmacists, and hospital pharmacists. Pharmacists' income followed the order of owner pharmacists, hospital pharmacists, and staff pharmacists. The actual income

of owner pharmacists was 85 million Korean Won (KRW) in 2010, decreased to 82 million KRW in 2012, and then increased, reaching a peak of 112 million KRW in 2019. Similarly, the inflation-adjusted income of owner pharmacists was 98 million in 2010, decreased to 90 million KRW in 2010, and then increased, reaching a peak of 112 million KRW in 2019. In contrast, the actual and inflation-adjusted income of staff pharmacists and hospital pharmacists showed a steady but modest increase over the same period. Figure 1c presents the income ratios of staff pharmacists and hospital pharmacists compared to owner pharmacists. In 2020, the income ratio of staff pharmacists and hospital pharmacists were 46% and 53%, respectively. Similarly, Fig. 1d presents the income ratio of female pharmacists compared to their male counterparts. In 2020, the income ratio of female hospital pharmacists was 109%, while those of female owner pharmacists and female hospital pharmacists was 92% and 83%, respectively.

Table 1 presents the annual income trends of pharmacists, disaggregated by gender, compared to average wage earners over the years. The income of owner pharmacists has consistently remained approximately 2.9 to 3.0 times higher than that of average wage earners. In contrast, the income of staff pharmacists and hospital pharmacists, while still higher than that of average wage earners, was
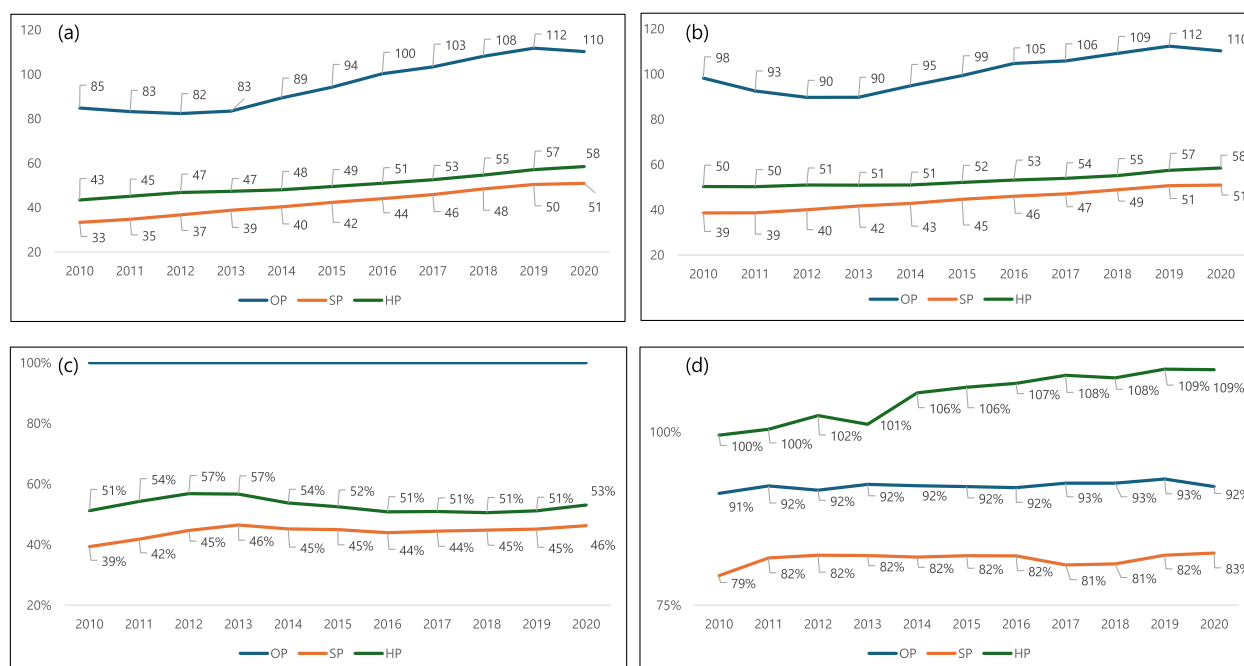
Fig. 1 Income trends and gender-based income ratios of owner pharmacists, staff pharmacists, and hospital pharmacists. **a** and **b** actual and inflation-adjusted income of owner pharmacists, staff pharmacists, and hospital pharmacists. **c** Income ratios of staff pharmacists and hospital pharmacists compared to owner pharmacists. **d** Gender-based income ratios of female pharmacists compared to their male counterparts. Note) The scale of vertical axis in million KRW. HP: hospital pharmacists, OP: owner pharmacists, SP: staff pharmacists

Table 1 Average Income of Pharmacists and Wage Workers from 2010 to 2020

	All							Male							Female						
	OP		SP		HP		W	OP		SP		HP		W	OP		SP		HP		W
	Mean	Ratio	Mean	Ratio	Mean	Ratio	Mean	Mean	Ratio	Mean	Ratio	Mean	Ratio	Mean	Mean	Ratio	Mean	Ratio	Mean	Ratio	Mean
2010	84.8	3.0	33.3	1.2	43.4	1.6	27.9	88.8	2.7	39.4	1.2	43.6	1.3	33.1	81.0	4.1	31.3	1.6	43.4	2.2	19.6
2011	83.2	2.9	34.8	1.2	45.1	1.5	29.1	86.6	2.5	40.1	1.2	45.0	1.3	34.4	79.9	3.9	32.8	1.6	45.2	2.2	20.6
2012	82.3	2.7	36.7	1.2	46.8	1.5	30.3	86.0	2.4	42.2	1.2	45.8	1.3	35.7	78.8	3.6	34.7	1.6	46.9	2.2	21.8
2013	83.5	2.7	38.8	1.2	47.3	1.5	31.4	86.8	2.3	44.5	1.2	46.9	1.3	37.1	80.2	3.6	36.5	1.6	47.4	2.1	22.5
2014	89.3	2.8	40.3	1.2	48.0	1.5	32.4	93.0	2.4	46.3	1.2	45.8	1.2	38.6	85.8	3.7	38.0	1.6	48.4	2.1	23.1
2015	94.2	2.9	42.3	1.3	49.4	1.5	32.9	98.1	2.5	48.5	1.2	46.9	1.2	39.2	90.4	3.9	39.8	1.7	49.9	2.1	23.3
2016	100.3	2.9	44.1	1.3	50.9	1.5	34.0	104.5	2.6	50.5	1.3	48.1	1.2	40.4	96.1	3.9	41.4	1.7	51.4	2.1	24.5
2017	103.3	3.0	45.9	1.3	52.6	1.5	34.8	107.3	2.6	53.2	1.3	49.1	1.2	41.2	99.3	3.9	43.0	1.7	53.2	2.1	25.3
2018	108.2	3.0	48.4	1.3	54.6	1.5	36.3	112.3	2.6	56.1	1.3	51.2	1.2	42.8	104.0	3.8	45.4	1.7	55.2	2.0	27.1
2019	111.8	3.0	50.4	1.3	57.1	1.5	37.7	115.7	2.6	57.7	1.3	53.0	1.2	44.2	107.8	3.8	47.4	1.7	57.9	2.0	28.5
2020	110.3	2.9	50.9	1.3	58.5	1.5	38.2	114.8	2.6	58.1	1.3	54.3	1.2	44.7	105.7	3.7	47.9	1.7	59.2	2.0	28.9

The ratio represents the income proportion of workers in a specific occupation relative to the total population of wage earners

HP hospital pharmacist, *OP* owner pharmacist, *SP* staff pharmacists, *W* waged earner

relatively lower compared to owner pharmacists, at 1.3 and 1.5 times that of average wage earners, respectively.

Trends in the distribution of pharmacists' income

Figure 2 presents the average income of owner pharmacists, staff pharmacists, and hospital pharmacists at the regional level. The income of pharmacists across sectors varied by region, and the relative income levels among these professions differed within each region. For instance, hospital pharmacists in Seoul had relatively high income levels, whereas the income levels of owner pharmacists and staff pharmacists were comparatively low. In contrast, hospital pharmacists in Jeonnam had relatively low income levels, while the income levels of owner pharmacists and staff pharmacists were comparatively high.
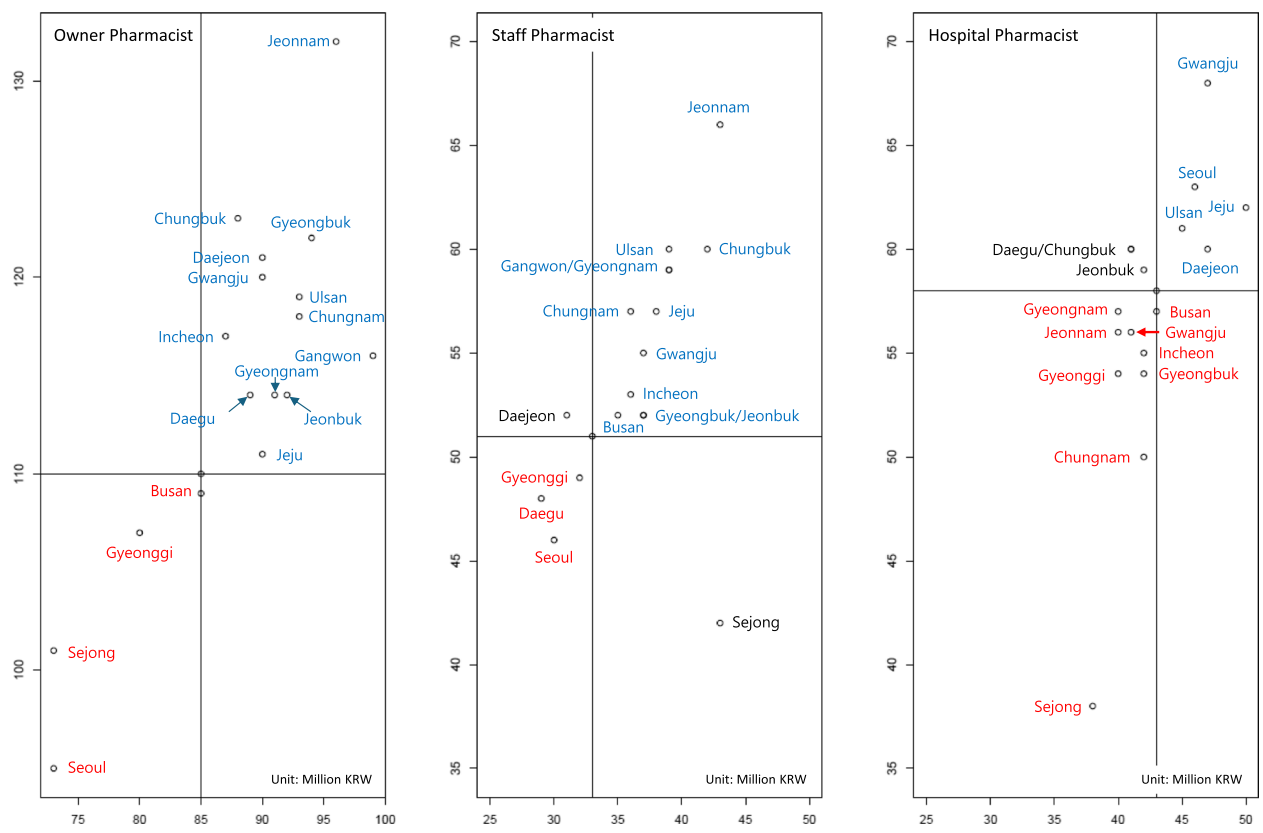
Figure 3 presents the Gini coefficients for the income of owner pharmacists, staff pharmacists, and hospital pharmacists. The income distribution of owner pharmacists showed a general tendency toward becoming more evenly distributed. However, while the income distribution of male owner pharmacists became more evenly distributed, the income distribution of female owner

pharmacists became less evenly distributed. The income of hospital pharmacists and staff pharmacists became more evenly distributed after 2015.

Interrupted time series analysis

Figure 4 presents the income of owner pharmacists, staff pharmacists, and hospital pharmacists before and after the graduation of an increased number of pharmacy students. After intervention, the slope for owner pharmacists has become steeper, regardless of gender. In contrast, the slope for both male and female staff pharmacists have not changed significantly. The slope for hospital pharmacists has slightly increased, with the increase being steeper for males compared to females.

Table 2 presents the results of the interrupted time series analysis at the national level. The slope change for owner pharmacists (3.37, $p = 0.0093$), staff pharmacists (0.25, $p = 0.0470$), and hospital pharmacists (0.77, $p = 0.0045$) were significant. The slope change for both owner pharmacists and hospital pharmacists were steeper for males compared to females. Specifically, the slope change for male and female owner pharmacists were 3.44 ($p = 0.0119$) and 3.28 ($p = 0.0075$), respectively.

Fig. 2 Average income of owner pharmacists, staff pharmacists, and hospital pharmacists by region in 2010 and 2020. Note) The horizontal axis represents income in 2010, while the vertical axis represents income in 2020. The scale of both axes is in million KRW. HP: hospital pharmacists, OP: owner pharmacists, SP: staff pharmacists
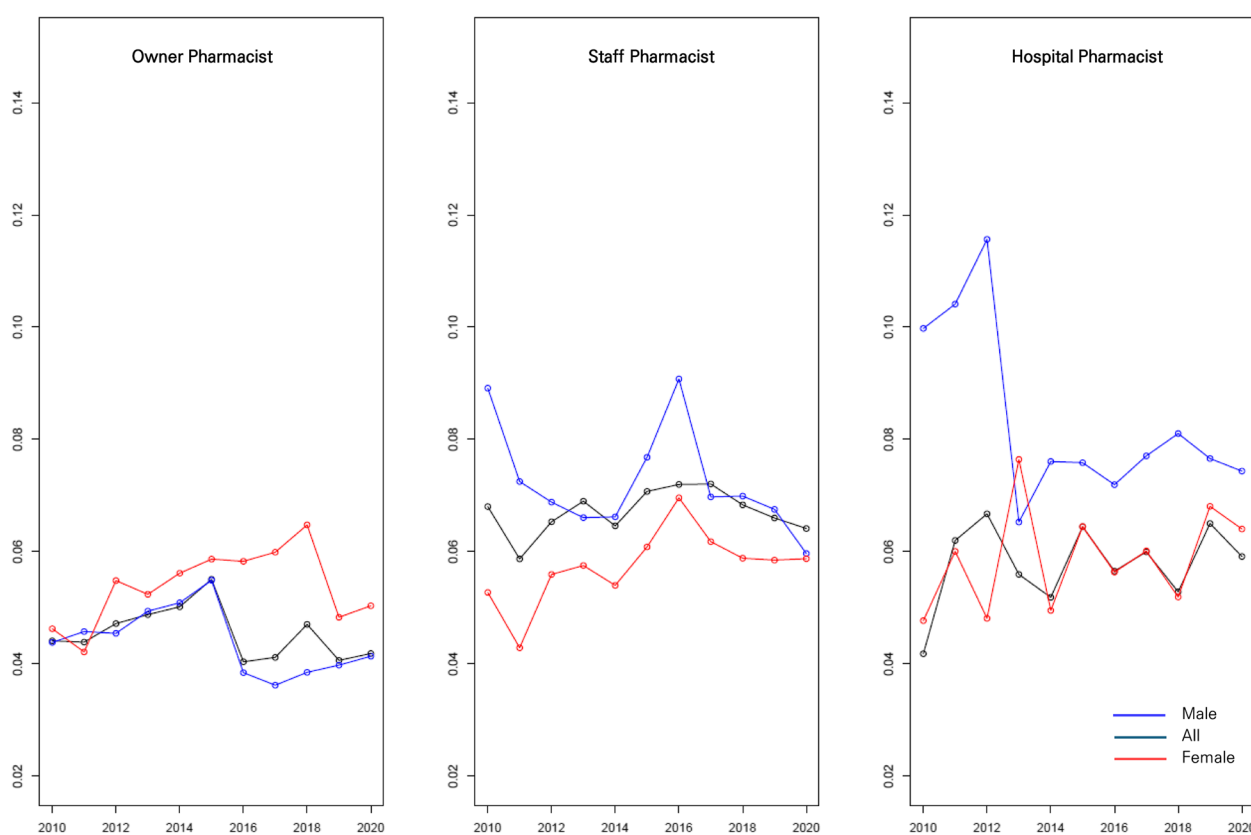
Fig. 3 Trends in the Gini coefficient for the income of owner pharmacists, staff pharmacists, and hospital pharmacists from 2010 to 2020. HP: hospital pharmacists, OP: owner pharmacists, SP: staff pharmacists

Similarly, the slope change for male and female hospital pharmacists were 0.93 ($p = 0.0164$) and 0.76 ($p = 0.0083$), respectively.

Discussions
Interesting findings
Several findings of this study are noteworthy. First, the income levels of pharmacists increased from 2010 to 2020. Second, the income of owner pharmacists, staff pharmacists, and hospital pharmacists varied by region, and the relative income levels among sectors also differed within each region. Third, the impact of the expansion of pharmacy schools on pharmacists' income varied across sectors. The expansion led to a substantial increase in the income of owner pharmacists, while the incomes of staff pharmacists and hospital pharmacists showed no significant changes.

The income levels and distribution of pharmacists
Despite the increase in pharmacy school admission quotas during this period, the income levels of pharmacists increased from 2010 to 2020, even after adjusting for inflation. By 2020, the income levels for owner

pharmacists, staff pharmacists, hospital pharmacists reached 110 million, 58 million, and 51 million KRW, respectively. The relatively lower income of staff pharmacists and hospital pharmacists appears to be associated with their working hours and employment types [34].

The study revealed that pharmacy is a female-friendly profession [6]. Although female owner pharmacists earned only 90% of what their male counterparts earned, the income of female owner pharmacists was 3.7 times greater than that of female wage workers, while the income of male owner pharmacists was 2.6 times higher than that of male wage workers. Similarly, the income of female hospital pharmacists and staff pharmacists was 2.0 times and 1.7 times higher than that of female wage workers, respectively. In contrast, the income of male staff pharmacists and hospital pharmacists was 1.3 times and 1.2 times that of male wage workers, respectively.

While the income of owner pharmacists is relatively high compared to other wage workers, a more comprehensive evaluation of their income level is required. Between 2010 and 2020, actual income of owner pharmacists increased by 25 million KRW, but inflation-adjusted income rose by only 14 million
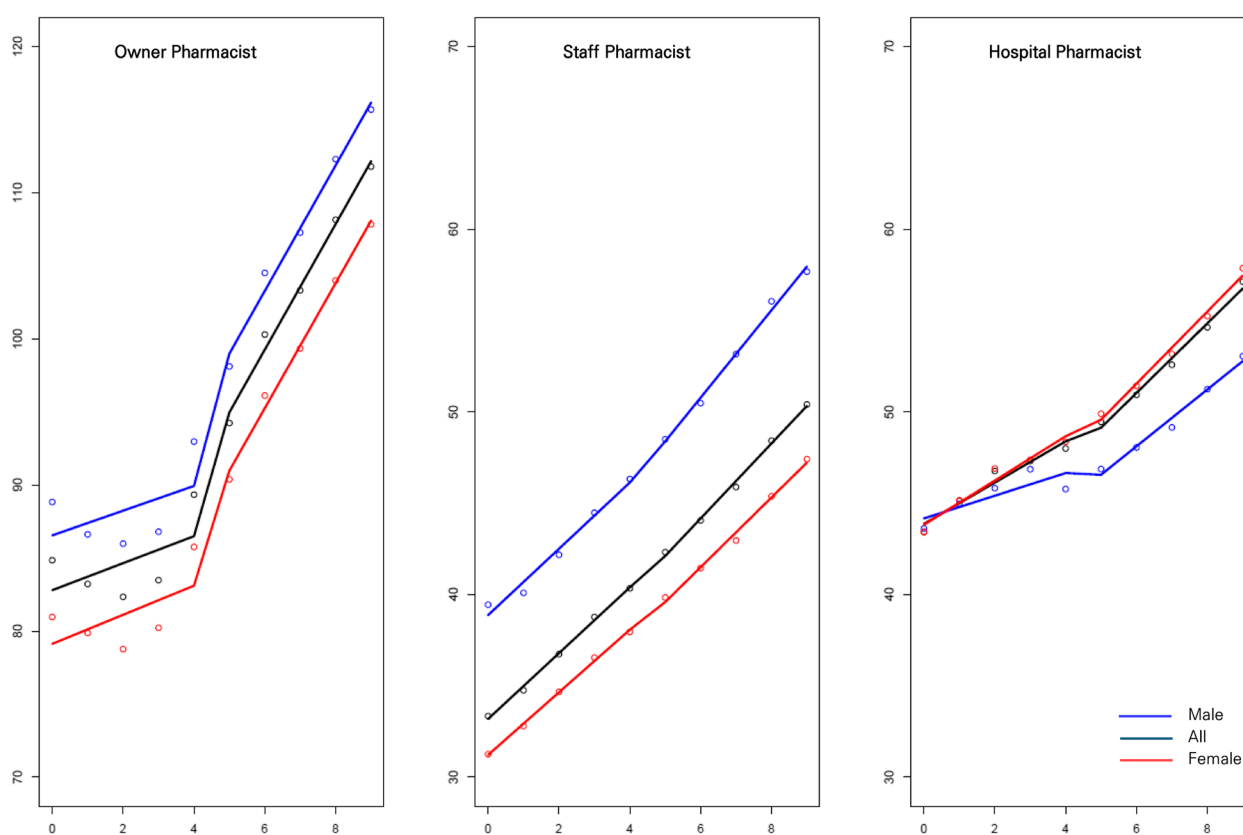
Fig. 4 Income of owner pharmacists, staff pharmacists, and hospital pharmacists before and after graduation of an increased number of pharmacy students. Note) The horizontal axis represent the year, starting from 2010, while the vertical axis represents the income of pharmacists, measured in millions of KRW. The black, blue, and red lines represent the income curve for all, male, and female pharmacists, respectively. HP: hospital pharmacists, OP: owner pharmacists, SP: staff pharmacists

Table 2 Results of interrupted time series analysis by gender

		Owner pharmacist			Staff pharmacist			Hospital pharmacist		
		Coefficient	SE	*P*-value	Coefficient	SE	*P*-value	Coefficient	SE	*P*-value
All	Pre slope	0.92	0.6332	0.1949	1.79	0.0721	<.0001	1.12	0.1478	0.0002
	Level change	4.17	2.6108	0.1608	−0.33	0.2972	0.3058	−1.16	0.5942	0.0987
	Slope change	3.37	0.8955	0.0093	0.25	0.1019	0.0470	0.77	0.1764	0.0045
Male	Pre slope	0.84	0.6852	0.2636	1.81	0.1456	<.0001	0.62	0.2004	0.0212
	Level change	4.76	2.8251	0.1428	−0.13	0.6005	0.8264	−1.64	0.8266	0.0938
	Slope change	3.44	0.9691	0.0119	0.57	0.2061	0.0307	0.93	0.2835	0.0164
Female	Pre slope	0.99	0.5881	0.1414	1.71	0.0788	<.0001	1.21	0.1398	0.0001
	Level change	3.59	2.4247	0.1889	−0.39	0.3252	0.2724	−1.06	0.5766	0.1129
	Slope change	3.28	0.8316	0.0075	0.19	0.1115	0.1297	0.76	0.1977	0.0083

KRW. However, both the cost of becoming a pharmacist and the expenses involved in owning a pharmacy have risen [35, 36]. Since 2015, the education period for newly graduated pharmacists has been extended from four to six years, adding an additional education cost of 18 million KRW [35]. Moreover, the cost of opening a pharmacy, including premiums and rent, has increased sharply in recent years [36]. Additionally, owner pharmacists typically work six days a week, often exceeding 50 h of work per week [37]. The high income of employed pharmacists may be attributable to extended working hours.

In terms of regional distribution, the income of owner pharmacists exhibits a more even distribution compared to that of staff pharmacists and hospital pharmacists. This trend has been observed in other countries as well [1]. The relatively uniform distribution of income among owner pharmacists may be attributed to their homogeneous work preferences [6]. In contrast, staff pharmacists and hospital pharmacists exhibit greater variability in their work arrangements [34]. For instance, some staff pharmacists prefer part-time work due to life circumstances such as pregnancy, childbirth, or childcare, while others may work full-time to gain experience before opening their own pharmacy. These heterogeneous work preferences contribute to greater income inequality among these groups.

Sector-specific impact of increased pharmacy schools on pharmacists' income

The income changes among owner pharmacists, staff pharmacists, and hospital pharmacists following the expansion of pharmacy schools reveal an interesting pattern. According to the interrupted time series analysis, the annual average income slope changes for owner pharmacists, staff pharmacists, and hospital pharmacists were 3.37 million, 0.25 million, and 0.77 million KRW, respectively. In other words, the annual income change of staff pharmacists was marginal compared to that of owner pharmacists. This raises an important question: why did such differential effects emerge following the expansion of pharmacy schools?

First, the expansion of pharmacy schools led to an oversupply of pharmacists relative to demand. In 2021, the average number of pharmacies per 100,000 population in OECD countries was 28 [38]. In the same year, Greece had the highest number with 97 pharmacies, followed by Spain (47) and Bulgaria (45). As of 2023, the number of pharmacies per 100,000 population in South Korea exceeds 48, indicating a significantly higher level compared to the OECD average [39]. With the introduction of the 2+4 system in 2011, the number of pharmacy school entrants increased by approximately 40%, from 1,210 to 1,693 students [13, 14]. The new system also raised the average age of students graduating pharmacy programs [18]. Many graduates aspire to work in pharmacies with the expectation of earning a high salary. However, as it is difficult to open a pharmacy immediately after graduation, a significant number of graduates seek to gain experience as staff pharmacists. Due to the relatively small size of pharmacies in South Korea [34], the number of available positions for these graduates is limited.

Second, the labor supply of staff pharmacists is inelastic [40–42]. From an economic perspective, inelastic labor supply is associated with lower wages [43]. Staff pharmacists are typically divided into full-time and part-time workers. Full-time staff pharmacists usually seek to gain experience with the aim of eventually opening their own pharmacy, whereas part-time staff pharmacists often prefer reduced working hours due to factors such as childcare, caregiving, or academic commitments. These workers tend to be more sensitive to non-monetary factors, such as working conditions and hours, rather than wages. Third, there is an unequal relationship in the labor exchange process between owner pharmacists and staff pharmacists [44, 45]. From a sociological perspective, inequality is often attributed to exploitation and opportunity hoarding [46]. In this context, individuals in positions of greater authority and power—such as capital owners—receive disproportionately larger rewards than laborers. With the oversupply of pharmacists, the power and status of owner pharmacists have increased, resulting in wage stagnation for staff pharmacists.

Policy implications

The increase in the number of pharmacists is not an issue unique to South Korea; similar trends have been observed in other countries, such as the United States. In the early 2000s, concerns about a pharmacist shortage in the United States led to an increase in the number of pharmacy schools, resulting in a significant rise in the number of pharmacy graduates [47]. Consequently, concerns about pharmacist shortages were largely alleviated by the early 2010s [22]. However, this rapid expansion contributed to an oversupply of pharmacists in the following years.

In recent years, the number of independent pharmacies has declined, and many chain pharmacies have closed, reflecting an oversupply of pharmacists relative to demand [48]. Despite these shifts, pharmacists' income in the United States has continued to rise steadily, although the growth rate has been somewhat lower compared to other healthcare professions [2]. This oversupply has also led to declining pharmacy school enrollment, raising concerns about a potential decrease in the future supply of pharmacists [49].

This study, which analyzes the income of owner pharmacists, staff pharmacists, and hospital pharmacists following the increase in pharmacy school admission quotas, provides valuable insights for global healthcare systems. Given these observations, policy recommendations are needed to address income disparities among pharmacists across different sectors and to mitigate the impact of staff pharmacist oversupply.

First, it is important to periodically adjust pharmacy school admission quotas based on labor market demand

to maintain a balanced workforce. Additionally, promoting diverse career pathways beyond community pharmacies—such as in research, the pharmaceutical industry, and public health—can help reduce job competition and expand income opportunities for staff pharmacists [50]. Moreover, policies that support fair wage practices and improve working conditions are essential [51], particularly for staff pharmacists facing wage stagnation due to inelastic labor supply. Continuous professional development programs should also be encouraged to enhance pharmacists' expertise and support career advancement, thereby reducing income inequality among staff pharmacists [52]. Finally, to address gender-based income disparities faced by female pharmacists, it is crucial to implement policies that promote equal pay and support work-life balance [53].

Study limitations

This study has several limitations. First, we used aggregated data to estimate the effect of the increase in pharmacy school admission quotas on the income of owner pharmacists, staff pharmacists, and hospital pharmacists. Specifically, we analyzed the average income of pharmacists at both the national level and across 17 regions. The use of micro-level data, such as individual income records, could further strengthen our findings. Second, we were unable to account for individual characteristics of pharmacists, leading us to treat all pharmacists equally. Given the significant influence of working hours on income, analyzing both working hours and hourly wages would provide a more comprehensive understanding of pharmacists' earnings. Third, in the interrupted time series analysis, we assumed identical pre- and post-intervention slopes. However, the post-intervention counterfactual slope may have been influenced by other uncontrolled factors, potentially affecting the accuracy of the results. Fourth, this study did not directly account for the increased number of pharmacies. Nevertheless, the impact of this increase is partially reflected in the average income of pharmacists. Future research could employ methods such as panel analysis to more precisely examine the effect of the number of pharmacies on pharmacists' income.

Conclusions

In 2011, pharmacy education in South Korea transitioned from a 4-year to a 6-year program, accompanied by an increase in the number of pharmacy schools and students. Despite the rise in the number of pharmacists, the profession remains attractive in terms of both income levels and distribution, particularly for female pharmacists. However, considering the rising costs of becoming a pharmacist and opening a pharmacy, a more comprehensive evaluation of income levels is necessary. Furthermore, this increase has had a more favorable impact on the income growth of owner pharmacists compared to staff and hospital pharmacists. Policy recommendations are needed to address income disparities among pharmacists across sectors and to mitigate the impact of staff pharmacist oversupply.

Declarations

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