

Original Research

Comparative analysis of pharmaceutical care, professional development, and policy compliance in chain vs. independent pharmacies: A Cross-sectional study

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Abstract

Background: The rapid proliferation of community chain pharmacies management models has garnered significant attention. Despite this surge, there is a notable scarcity of research that comprehensively evaluates this model in comparison to traditional independent pharmacies. **Objective:** This study aims to analyze pharmacists' insights into the status of community pharmacy management models, specifically comparing chain pharmacies to traditional independent pharmacies. We employed a framework assessing 40 aspects across five critical pillars: 1) Pharmaceutical care & Patient Services, (2) Professional development and Working environment, (3) Economic considerations, (4) Legal aspects, and 5) General concerns. **Methods:** This cross-sectional analytical study utilized a validated and reliable online survey (Lawshe's content validity ratio > 0.741, $p < 0.05$, Cronbach's alpha = 0.86) distributed among pharmacists. The analysis included measurements of associations and the strength of association to explore significant results. **Results:** A total of 835 pharmacists responded. Gender, workplace, and responder qualifications exhibited no significant association ($P > 0.05$) with pharmacy model preferences. However, older participants and those with increased years of experience demonstrated a very strong statistically significant association toward preferring independent pharmacies ($P < 0.001$, Cramer's V (ϕ_c) for age > 48 = 0.7) and experience ($P < 0.001$, (ϕ_c) for > 6-year experience = 0.52). Overall, independent pharmacies were favoured over chain pharmacies (43.7% vs 29.5%, $P < 0.001$). Quality of pharmaceutical care parameters indicated that independent pharmacies were perceived as superior to chains in patient consultation ($p < 0.001$), reduced waiting time for patients ($p < 0.001$), and better longer-term relationships ($p < 0.001$). Regarding economic impact, chain pharmacies were perceived to yield higher profits and more sales for non-medical products ($P < 0.001$). Independent pharmacies generally exhibited a superior profile in legislative parameters compared to chain pharmacies, including compliance with ownership regulations ($P < 0.001$) and bequeathable practices ($P < 0.001$). Chain pharmacies were perceived to provide better professional development to their staff compared to independent pharmacies ($P < 0.001$). **Conclusion:** The significant expansion of chain pharmacies in the market highlights the imperative need for the establishment of new regulations and criteria. These measures are crucial to guarantee stability and equity for both chain and independent pharmacies operating within the market.

Keywords: Community pharmacy services, Pharmaceutical Care, Professional Competence, Working Conditions, Policy Making, Pharmaceutical Economics, and Legislation of pharmacies. Community pharmacy models, Chain pharmacies

INTRODUCTION

The global retail trade sector has undergone significant changes, with the rise of large national chains being a notable feature¹. The evolution has likewise influenced the pharmacy sector in Jordan, Egypt, and the Middle East, resulting in an upswing in the prevalence of chain pharmacies. Nevertheless, this expansion has been accompanied by financial setbacks

affecting key stakeholders in the pharmacy market²⁻⁵.

In contrast to the extensive examination of quality indicators for community practice since 1999 by the World Health Organization (WHO)⁶ and the subsequent in-depth exploration in the joint 2011 report by WHO and the International Pharmaceutical Federation⁷, there is a notable scarcity of research on matters pertaining to chain pharmacies, especially when compared to individual pharmacies^{8,9}.

In general context, few studies have focused on pharmaceutical care processes⁸ while others have concentrated on economic costs². Some studies have explored human resources management in chain pharmacies, examining knowledge and attitudes about functions^{10,11}. Patient perspectives have been explored, with recent research highlighting factors such as gender, age, and education level influencing pharmacy type selection^{9,12-14}. Studies have compared the quality of care delivered in childhood diarrhoea and suspected tuberculosis cases between chain and independent pharmacies¹⁵. Accessibility was also analysed based on geographical distribution by another research⁵.

The chain pharmacy system in the Middle East is in a nascent

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developmental phase, facing obstacles and challenges. In Jordan, there are 63 pharmacy chains and around 3,780 independent pharmacies. The establishment of pharmacy chains was facilitated by the Jordanian Temporary Drug and Pharmacy Law No. 80 of 2001, which initially allowed an unlimited number of pharmacists as partners, resulting in an unrestricted number of branches⁴. Concerns about market monopolization led to the introduction of Drug and Pharmacy Law No. 12 of 2013, capping each registered Pharmacy Chain company at a maximum of 40 branches¹⁶.

The primary objective of this study is to conduct a detailed and comprehensive analysis of the current status of local pharmacy chains, specifically focusing on their influence in comparison to independent pharmacies within the pharmacy profession. To achieve this goal, our research team, in collaboration with consulting experts, has meticulously formulated and refined 40 distinct aspects for assessment.

The investigation evaluates five critical pillars: (i) Pharmaceutical care and Patient services, (ii) Professional development and Working environment, (iii) Economic considerations, (iv) Legal aspects, and (v) General concerns, encompassing preferences. The findings of this research should form the basis for strategic interventions and evidence-based recommendations benefiting stakeholders in the pharmacy profession.

METHODS

Survey development

Our research team systematically developed an online survey to address key real-world challenges. The final version was curated by integrating expert suggestions in accordance with established content validity standards. The item selection process was based on a content validity ratio (CVR) assessed by a panel of eight experts, comprising two academic experts in pharmacy practice, two senior pharmacists from chain pharmacies, two senior pharmacists from independent pharmacies, and two regulatory pharmacists specializing in drug policy and patient safety. Only items surpassing Lawshe's CVR threshold of 0.741 at a significance level of $p < 0.05$ were retained for survey inclusion¹⁷. The questionnaire demonstrated commendable overall internal consistency with a Cronbach's alpha of 0.86. A Copy of the original circulated survey -in Arabic language- is available in Supplement file S.1.

The survey is structured into five key sections with 40 aspects, designed under the mnemonic "PPPELG" (Pharmaceutical Care and Patient services, Professional Development, Economic Considerations, Legal Aspects, and General Concerns). See Supplement file S.2 for all 40 aspects.

Sampling and data collection

Qualified participants for this study were licensed Jordanian Pharmacists. Participation in the study was entirely voluntary and posed no risks to the individuals involved. Completion of the survey by potential participants was construed as their informed consent to participate in the study. The survey dissemination took place over a 70-day period from March to

June 2021 through social media platforms such as Facebook and WhatsApp.

Ethical clearance was obtained from Hashemite University Institutional Review Board, with decision reference number (2/4/2020/2021), confirming adherence to ethical standards and guidelines.

Sample size calculations and Statistical methods

With a confidence level of 99% and margin of error of 5%, A sample size of a minimum of 647 participants was considered representative, based on the number of licensed pharmacists in Jordan (26,686) as recommended by Taherdoost¹⁸ and carried out by the sample size calculator¹⁹.

Responses were coded and transferred to SPSS for Windows, version 25, for statistical analysis (SPSS Inc., Chicago, IL, USA). For data analysis, descriptive analysis was first conducted to present participant characteristics and their responses to survey items: frequency (%) for category data; mean and Standard Deviation (SD) for continuous data.

To determine whether there is an association between the participants variables and their responses, the chi-squared test for association was used (Fishers exact test was used in cases where the expected count was less than five). To measure the strength of association of a nominal-by-nominal relationship (and is a measure of effect size), Cramer's V coefficient was also calculated, According to Akoglu, value of "1" indicated a complete association, ">0.25" represented a very strong association, ">0.15" indicated a strong association, ">0.1" suggested a moderate association, and ">0.05" implied a weak association, "0" denoted no association²⁰

RESULTS

Demographics of respondents

Table 1-A presents an overview of the demographic characteristics of the 835 participants involved in this study. Females accounted for 63.2%, whereas males constituted 35.6% of the participants. The average age was 31.4 (SD = 10.5), with 37% of the participants falling under the age of 25. Regarding the working sector, 24.2% were employed, and 15% were owners of independent community pharmacies. Approximately 10% were employees in chain pharmacies, while 1.3% owned chain pharmacies. In terms of educational qualifications, the majority (66.6%) held a Bch pharmacy degree, 8% possessed a PharmD, and nearly 10% had a postgraduate qualification. Geographically, 75% of the respondents were based in Amman, Zarqa, and Irbid, with percentages of 44.8%, 16.3%, and 12.1%, respectively.

Demographics and preference association with pharmacy type

In the analysis, female respondents (41.1% and 49.2%, respectively) showed a preference for independent pharmacies over chain pharmacies; however, gender was not statistically associated with this preference ($p = 0.082$, see Table 2-B).



Table 1. Demographic characteristics with the test for association toward pharmacy type preference.

A) Demographics Description.			B) The association between demographic variables and pharmacists' preferences.			
Demographics		Total = 835	Within category preference			P value chi-squared test for association
Variables	Categories (groups)	N (%) distribution	Chain (%)	Independent (%)	No preference	
Total		835 (100)	246 (29.5)	365 (43.7)	224 (29.8)	<0.001*
Gender	Females	528 (63.2)	163 (30.9)	217 (41.1)	148 (28.0)	0.082
	Males	297 (35.6)	80 (26.9)	146 (49.2)	71 (23.9)	
	Prefer not to say	10 (1.2)	3 (30)	2 (20)	5 (50)	
Age Groups	19-22	97 (11.6)	40 (41.2)	27 (27.8)	30 (30.9)	<0.001*
	23	110 (13.2)	32 (29.1)	39 (35.5)	39 (35.5)	
	24	103 (12.3)	32 (31.3)	38 (36.9)	33 (32.0)	
	25 - 34	276 (33.1)	95 (34.4)	102 (37.0)	79 (28.6)	
	35 – 48*	167 (19.9)	37 (22.2)	103 (61.7)	27 (16.2)	
	>48*	82 (9.7)	10 (12.2)	56 (68.3)	16 (19.5)	
City of work	Amman	374 (44.8)	108 (28.9)	168 (44.9)	98 (26.2)	0.091
	Zarqa	136 (16.3)	38 (27.9)	63 (46.3)	35 (25.7)	
	Irbid	101 (12.1)	31 (30.7)	48 (47.5)	22 (21.8)	
	Albalqa	32 (3.8)	6 (18.8)	12 (37.5)	14 (43.8)	
	Almafraq	28 (3.4)	11 (39.3)	11 (39.3)	6 (21.4)	
	Aqaba	26 (3.1)	11 (42.3)	10 (38.5)	5 (19.2)	
	Jerash	20 (2.4)	8 (40)	8 (40)	4 (20)	
	Alkarak	13 (1.6)	3 (23.1)	9 (69.2)	1 (7.7)	
	Others	24 (2.9)	8 (33.3)	10 (41.7)	6 (25)	
	Outside Jordan	81 (9.7)	22 (27.2)	26 (32.1)	33 (40.7)	
Years of experience	No experience	123 (14.7)	38 (30.69)	40 (32.5)	45 (36.6)	<0.001*
	Less 1 year	229 (27.4)	82 (35.8)	78 (34.1)	69 (30.1)	
	1- 2 years	147 (17.6)	53 (36.1)	50 (34)	44(29.9)	
	3-6 years*	94 (11.3)	23 (24.5)	40 (42.6)	31 (33)	
	>6 years*	242 (29.0)	50 (20.7)	157 (64.9)	35 (14.5)	
Current working sector*	Currently I don't work	267 (32.0)	96 (36)	88 (33)	83 (31.1)	<0.001
	Employee independent Pharmacy*	202 (24.2)	45 (22.3)	96 (47.5)	61 (30.2)	
	Owner of an independent pharmacy*	125 (15.0)	10 (8.0)	102 (81.6)	13 (10.4)	
	Employee chains*	82 (9.8)	48 (58.5)	18 (22.0)	16 (19.5)	
	Drug Stores	47 (5.6)	12 (25.5)	20 (42.6)	15 (31.9)	
	Academia	35 (4.2)	10 (28.6)	11 (3.4)	14 (40.0)	
	Others	28 (3.4)	10 (35.7)	13 (46.4)	5 (17.9)	
	Hospitals	17 (2.0)	4 (23.5)	5 (29.4)	8 (47.1)	
	Public Sector	15 (1.8)	4 (26.7)	6 (40.0)	5 (33.3)	
	Owner chain pharmacy	11 (1.3)	7 (63.6)	3 (27.3)	1 (9.1)	
	Drug Factories	6 (0.7)	0 (0)	3 (50)	3 (50)	
Degree	BSc	556 (66.6)	159 (28.6)	248 (44.6)	149 (26.8)	0.575
	PharmD	70 (8.4)	27 (38.6)	27 (38.6)	16 (22.9)	
	MSc	52 (6.2)	12 (23.1)	25 (48.1)	15 (28.8)	
	Ph.D.	30 (3.6)	10 (33.3)	9 (30.0)	11 (36.7)	
	Diploma	127 (15.2)	38 (29.9)	56 (44.1)	33 (26.0)	

P-values were derived from the Chi-squared test of association; statistical significance set at $\alpha < 0.05$.

* Categories indicate those exerting the strongest influence, as determined by post hoc Cramer's V association.

Table 2. Pharmaceutical Care Services and Patient care evaluation.			
Statement	Pharmacy Type	Total (n=835)	P value (chi-squared test)
		N %	
Which type delivers better quality of pharmaceutical care?	Chain	229	0.13
		27.40%	
	Independent	198	
		23.70%	
	Both types	408	
		48.90%	
Which type provides better community services in terms of social accountability?	Chain	255	0.54
		30.50%	
	Independent	269	
		32.20%	
	Both types	311	
		37.20%	
Which type offers better operations for chronic medication prescriptions?	Chain	296	0.007*
		35.40%	
	Independent	219	
		26.20%	
	Both types	320	
		38.30%	
Which type is more effective in securing rare medications?	Chain	542	<0.001*
		64.90%	
	Independent	100	
		12.00%	
	Both types	193	
		23.10%	
Which type excels in delivering better patient counselling?	Chain	165	<0.001*
		19.80%	
	Independent	303	
		36.30%	
	Both types	367	
		44.00%	
Which type provides faster services with less waiting time?	Chain	203	<0.001*
		24.30%	
	Independent	341	
		40.80%	
	Both types	291	
		34.90%	

Which type is superior in creating rapport and fostering longer-term relationships with patients?	Chain	80	<0.001*
		9.60%	
	Independent	545	
		65.30%	
Which type has a more favorable ergonomic position for delivering services such as vaccinations?	Chain	210	<0.001*
		25.10%	
	Independent	486	
		58.20%	
	Independent	328	<0.001*
		39.30%	
	Both types	21	
		2.50%	

*Statistically significant difference between pharmacy types at level of <0.05.

Respondents from Amman (44.9% vs. 28.9%) and Zarqa (46.3% vs. 27.9%) consistently favored independent pharmacies, a trend observed across most regions. However, workplace location did not demonstrate a statistically significant association with this preference ($p = 0.091$). Likewise, the type of degree held by respondents showed no significant association ($p = 0.57$).

As illustrated in Table 1.B, participant age demonstrated a significant association with pharmacy preference ($p < 0.001$). Those aged over 35 exhibited a distinct inclination toward independent pharmacies compared to other age categories, indicating a stronger preference as age increased (Cramer's V (ϕ) for age > 48 was 0.7, while respondents aged 35-48 had a Cramer's V (ϕ) of 0.47).

Similarly, years of experience also correlated with significant preference ($p < 0.001$), revealing that participants with over 3 years of experience strongly favored independent pharmacies compared to those with shorter tenures. Notably, almost 65% of participants with over 6 years of experience preferred independent pharmacies, in contrast to 20.7% who favored chain pharmacies ($p < 0.001$, Cramer's V (ϕ) = 0.52).

Current working sectors had a pronounced impact on participants' preferences, with the most significant association observed among independent pharmacy owners. This group overwhelmingly preferred their pharmacy type over chain pharmacies (81.6% vs. 8.0%, $p < 0.001$, Cramer's V (ϕ) = 0.82). In contrast, post hoc analysis demonstrated that respondents employed outside the community pharmacy sector showed no statistically significant differences in their preferences across the comparison groups.

Pharmaceutical Care Services and Patient Care

Based on the comprehensive analysis of all respondents, as presented in Table 2, nearly half (48.9%) affirmed that both types of pharmacies are similar in delivering pharmaceutical care. A nearly even split emerged when respondents were asked about which kind of pharmacies provide better community services in terms of social accountability (30.5% chain, 32.2% independent, $X^2(1) = 0.37$, $p = 0.54$).

The consensus, as indicated in Table 2, was that chain pharmacies excel in securing rare medications compared to independent pharmacies (64.9% vs. 12%, $X^2(1) = 304.3$, $p < 0.001$). Respondents also perceived chain pharmacies as more adept at providing and managing chronic medication prescriptions than independent pharmacies (35.4% vs. 26.2%, $X^2(1) = 11.5$, $p = 0.007$). Furthermore, a significant majority (58%) agreed that chain pharmacies have a better ergonomic position to deliver services such as vaccinations compared to independent pharmacies (58.2% vs. 39.3%, $X^2(1) = 189.8$, $p < 0.001$).

Findings also highlight that independent pharmacies were perceived as superior in various quality parameters, including delivering patient counselling compared to chain pharmacies (36.3% vs. 19.8%, $X^2(1) = 40.7$, $p < 0.001$), serving patients faster with reduced waiting times (40.8% vs. 24.3%, $X^2(1) = 35.0$, $p < 0.001$), and building better rapport for longer-term relationships (65.3% vs. 9.6%, $X^2(1) = 345.9$, $p < 0.001$). For an executive summary kindly see the Supplement file (S3. .docx).

Professional Development and Working Environment

As seen in Table 3, responses to the question on which type provides a better working environment for employees revealed a nearly equal distribution, with 35% favoring chain pharmacies, 32.1% supporting independent pharmacies, and 32.9% considering both equal. However, a significant difference emerged in opinions regarding financial benefits, where 60.2% indicated a preference for chain pharmacies compared to 15% for independent pharmacies ($X^2(1) = 227.5$, $p < 0.001$). Similar trends were observed for health insurance and social security benefits, with 71.3% favoring chain pharmacies and only 6.1% supporting independent pharmacies ($X^2(1) = 458.1$, $p < 0.001$).

The perception of chain pharmacies as superior extended to employee professional development and training, with 59.5% favoring chain pharmacies and 14.3% supporting independent pharmacies ($X^2(1) = 231.9$, $p < 0.001$). Chain pharmacies were also perceived to create more job opportunities for pharmacists and offer higher job security compared to independent

Table 3. Professional Development and Working Environment.			
Statement	Pharmacy Type N %	Total (n=835)	P value (chi-squared test)
Which type offers an improved working environment for employees?	Chain 35.00%	292	0.31
	Independent 32.10%	268	
Which type provides superior financial benefits for employees?	Both types 32.90%	275	<0.001*
	Chain 60.20%	503	
Which type ensures greater job security for their employees?	Independent 15.00%	125	<0.001*
	Both types 24.80%	207	
Which pharmacies ensure greater job security for their employees?	Chain 42%	351	0.001*
	Independent 22.2%	185	
Which type offers enhanced benefits such as health insurance and social security?	Both types 35.8%	299	<0.001*
	Chain 71.30%	595	
Which type offers enhanced benefits such as health insurance and social security?	Independent 6.10%	51	<0.001*
	Both types 22.60%	189	
Which type provides superior professional development and training opportunities for employees?	Chain 59.50%	497	<0.001*
	Independent 14.30%	119	
Which type creates more job opportunities for pharmacists?	Both types 26.20%	219	<0.001*
	Chain 74.60%	623	
Which type creates more job opportunities for pharmacists?	Independent 7.80%	65	<0.001*
	Both types 17.60%	147	
Which type creates more job opportunities for pharmacists' assistants?	Chain 29.80%	249	<0.001*
	Independent 44.40%	371	
Which type creates more job opportunities for pharmacists' assistants?	Both types 25.70%	215	<0.001*

Which type is perceived to have a more negative impact on overall pharmacy profession for individual pharmacists?	Chain 60.00%	501	<0.001*
	Independent 11.50%	96	
	Both types 28.50%	238	
Which type exhibits better supply chain management?	Chain	535	<0.001*
		64.10%	
	Independent	97	
		11.60%	
	Both types	203	
		24.3%	
Which type demonstrates superior operations for medicines management?	Chain	485	<0.001*
		58.10%	
	Independent	111	
		13.30%	
	Both types	239	
		28.6%	
*Statistically significant difference between pharmacy types at level of <0.05.			

pharmacies (74.6% vs. 7.8%, $X^2(1) = 452.6$, $p < 0.001$) and (42% vs. 22.2%, $X^2(1) = 51.4$, $p = 0.001$), respectively. Conversely, independent pharmacies were viewed as creating more jobs for assistant pharmacists compared to chain pharmacies (44.4% vs. 29.8%, $X^2(1) = 24.0$, $p < 0.001$).

Chain pharmacies are widely considered to excel in applying efficient and advanced procedures for supply chain and medicines management compared to independent pharmacies (64.1% vs 11.6%, $X^2(1) = 303.5$, $p < 0.001$) and (58.1% vs 13.3%, $X^2(1) = 234.7$, $p < 0.001$), respectively.

Despite these findings, chain pharmacies were overwhelmingly perceived to have a more negative impact on the individual pharmacist's profession compared to independent pharmacies (60.0% vs. 11.5%, $X^2(1) = 274.7$, $p < 0.001$). For an executive summary kindly see the Supplement file (S3. .docx).

Pharmacists' views on the economic considerations

Table 4 reveals a unanimous consensus among respondents regarding the profit-oriented objectives of chain pharmacies over independent pharmacies, with 46.2% acknowledging that their aim for higher profits and cost savings compared to 14.9% for independent pharmacies ($X^2(1) = 134.6$, $p < 0.001$). This profit-centric inclination aligns with the pattern of interest in quantitative selling non-medical products, such as cosmetics and food supplements, as 62.9% believe chain pharmacies are more interested in selling these items, while only 10.9% attribute this concern to independent pharmacies (62.9% vs 10.9%, $X^2(1) = 305.8$, $p < 0.001$). Nevertheless, 44.6% reported that prices of non-medication items like cosmetics and food supplements are higher in independent pharmacies, contrasting with 21.2% who reported higher prices in chain

pharmacies ($X^2(1) = 69.2$, $p < 0.001$).

Respondents reinforce the perception of greater overall income generation by chain pharmacies, with 72.9% acknowledging this advantage over independent pharmacies (72.9% vs 11.0%, $X^2(1) = 381.3$, $p < 0.001$). Regarding the national economy, 37.6% of respondents perceive chain pharmacies as main contributors, in contrast to 16.9% who associate this contribution with independent pharmacies ($X^2(1) = 65.8$, $p < 0.001$).

In terms of financial stability, 36.4% of respondents view chain pharmacies as more stable, aligning closely with the 40.6% who express a similar perception for independent pharmacies; no statistically significant differences were observed, as indicated by the p value of 0.17 ($X^2(1) = 1.9$, $p = 0.17$). For an executive summary kindly see the Supplement file (S3. .docx).

Figure 1 vividly presents participants' perspectives on various economic aspects and impacts of chain pharmacies. A significant consensus emerges as 73% of participants (37% agree and 36% strongly agree) believe that chain pharmacies contribute to a market monopoly ($X^2(1) = 391.9$, $p < 0.001$). Similarly, for the perception that chain pharmacies may lead to the insolvency of nearby independent pharmacies, a combined 77% (40% agree and 37% strongly agree) is reported, showing a significant statistical difference ($X^2(1) = 464.7$, $p = 0.001$). Concerning the increase in rent costs in the neighborhood areas, a collective 65% (33% agree and 32% strongly agree) supports this notion, demonstrating a significant statistical difference ($X^2(1) = 357.4$, $p < 0.001$).

Moving forward, the impact of chain pharmacies on attracting customers from independent pharmacies is highlighted, with

Table 4. The Economic Evaluation.			
Statement	Pharmacy Type	Total (n=835)	P value (chi-squared test)
		N %	
Which type strives to attain greater profits? (Profit Orientation)	Chain	386	<0.001*
		46.20%	
	Independent	124	
		14.90%	
	Both types	325	
		38.90%	
Which type exhibits a heightened interest in retailing non-medical products? *	Chain	525	<0.001*
		62.90%	
	Independent	91	
		10.90%	
	Both types	219	
		26.20%	
The prices of non-medication items are higher in which type? *	Chain	177	<0.001*
		21.20%	
	Independent	372	
		44.60%	
	Both types similar	286	
		34.30%	
Which type generates greater overall income? *	Chain	609	<0.001*
		72.90%	
	Independent	92	
		11.00%	
	Both types	134	
		16.00%	
Which type demonstrates greater financial stability?	Chain	304	0.17
		36.40%	
	Independent	339	
		40.60%	
	Both types	192	
		23.00%	
Which type provides more substantial support to the national economy? *	Chain	314	<0.001*
		37.60%	
	Independent	141	
		16.90%	
	Both types	380	
		45.50%	

*Statistically significant difference between pharmacy types at level of < 0.05.

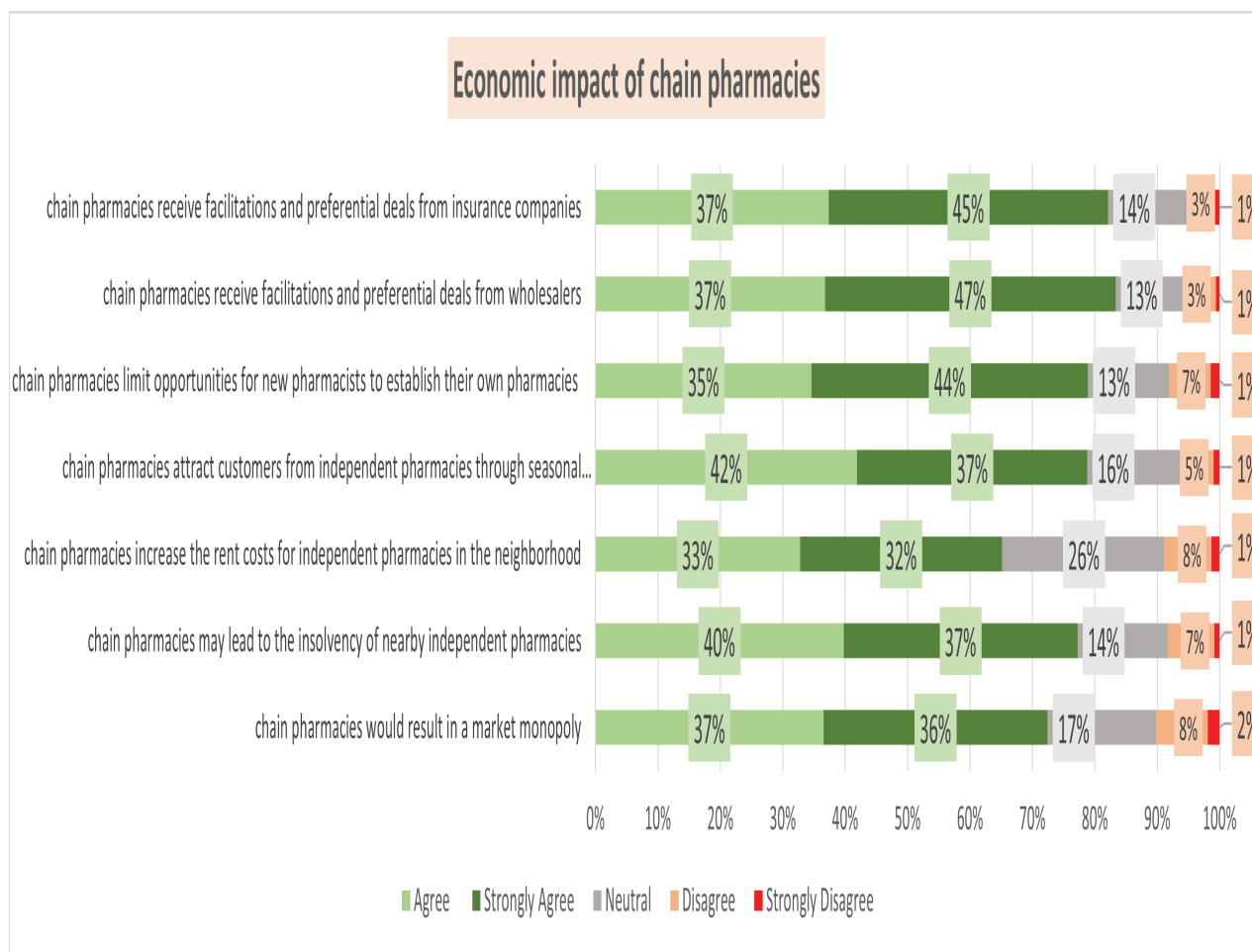


Figure 1. Economic Dimensions and Impacts of Chain Pharmacies

79% of participants (42% agree and 37% strongly agree), showcasing a substantial consensus ($X^2(1) = 532$, $p < 0.001$). This sentiment extends to the belief that chain pharmacies limit opportunities for new pharmacists to establish their own pharmacies, with a notable 79% majority ($X^2(1) = 503.8$, $p < 0.001$).

Additionally, Figure 1 underscores that chain pharmacies receive facilitations and preferential deals from wholesalers and insurance companies. The statistical analysis reveals an overwhelming agreement among participants, with 84% ($X^2(1) = 616.3$, $p < 0.001$) and 82% ($X^2(1) = 585.2$, $p < 0.001$), respectively, supporting this perception.

Pharmacists' perceptions of the legislative aspects

Table 5 reveals a significant proportion of respondents (40.7%) believe that independent pharmacies surpass chain pharmacies in adhering to ownership regulations, whereas only 18.8% hold the opposite view ($X^2(1) = 67.4$, $p < 0.001$).

In terms of professional practice laws and regulations, the majority of respondents (41.6%) feel that both independent and chain pharmacies demonstrate good compliance. Although

42.0% agree that both types comply with assigned weekly off days ($p = 0.12$), chain pharmacies are perceived to be more committed to adhering to assigned daily working hours compared to independent pharmacies (40.7% vs 17.6%, $X^2(1) = 76.5$, $p < 0.001$). Regarding the use of trademarks, while 48.1% confirm similar compliance levels for both types, 35.3% believe chain pharmacies are more committed than independent pharmacies ($X^2(1) = 67.8$, $p = 0.001$).

Respondents perceive official inspections by regulatory bodies to be similarly applied to both chain and independent pharmacies (25.7% and 30.3%, $X^2(1) = 3.1$, $p = 0.08$). Inheritance-related issues are perceived to be easier with independent pharmacies, with 56.2% stating it's easier to bequeath an independent establishment compared to chain pharmacies (56.2% vs 12%, $X^2(1) = 239.3$, $p < 0.001$). For an executive summary kindly see the Supplement file (S3. .docx).

Synthesis: A Comprehensive Overview of Pharmacy Preferences

In summary, when considering all variables collectively, the majority of respondents (43.7%) express a preference for independent pharmacies over chain pharmacies, while only

Table 5. The legislation evaluation.			
Statement	Pharmacy Type	Total (n=835)	P value (chi-squared test)
		N %	
Which type exhibits superior adherence to ownership regulations? *	Chain	157	<0.001*
		18.80%	
	Independent	340	
		40.70%	
	Both types	338	
		40.50%	
Which type demonstrates better compliance with professional practice laws and regulations?	Chain	215	0.087
		25.70%	
	Independent	273	
		32.70%	
	Both types	347	
		41.60%	
Which type adheres more effectively to assigned weekly off days?	Chain	257	0.12
		30.80%	
	Independent	227	
		27.2%	
	Both types	351	
		42.00%	
Which type shows better compliance with assigned daily working hours? *	Chain	340	< 0.001*
		40.70%	
	Independent	147	
		17.60%	
	Both types	348	
		41.70%	
Which type demonstrates better adherence to regulations regarding the use of trademarks? *	Chain	295	0.001*
		35.30%	
	Independent	138	
		16.50%	
	Both types	402	
		48.10%	
Which type is more likely to undergo official inspections by regulatory bodies?	Chain	215	0.08
		25.70%	
	Independent	253	
		30.30%	
	Both types	367	
		44.0%	
Which type effectively manages issues related to bequeathal*?	Chain	100	< 0.001*
		12.00%	
	Independent	469	
		56.20%	
	Both types	266	
		31.80%	
*Statistically significant difference between pharmacy types at level of < 0.05.			

29.5% favor the chain pharmacy model (43.7% vs 29.5%, $X^2(1) = 23.2$, $p < 0.001$). This preference is further reinforced by respondents' views on which type of pharmacies they envision dominating the market in the future. Here, 43.8% of respondents express a preference for independent pharmacies, in contrast to 18.3% who favor chain pharmacies taking the lead (43.8% vs 18.3%, $X^2(1) = 87.4$, $p < 0.001$). For a comprehensive overview of all findings, refer to the executive summary compiled in Supplement file (S3. .docx). More than 70% of the respondents, regardless of their job sector, believe that the current legislation is not enough and amendments are needed to achieve justice among both types of pharmacies and prevent monopolization of the market. Details of responses among responders based on job sector are illustrated in Supplement 4 Figure.

DISCUSSION

While quality indicators in community pharmacy services have been thoroughly investigated, exemplified by programs like The Quality Care Pharmacy Program (QCPP) in Australia²¹, the Pharmacy Quality Alliance program in the USA²², and the Pharmacy Quality Scheme in the UK²³, there is a notable gap in the direct comparison of comprehensive aspects—specifically, Pharmaceutical Care & Patient Services, Professional Development, Working Environment, Economic Considerations, Legal Aspects, and General Concerns—between Chain Pharmacies and the Independent model, as assessed by pharmacists. This absence of comparative studies restricts our ability to benchmark our findings against existing literature. However, some specific aspects allow for limited comparisons.

The preference for independent pharmacies among pharmacists reflects a nuanced perspective, emphasizing perceived strengths like personalized care and professional autonomy. Despite robust outcomes within the present study's context, comparing with existing literature is challenging due to its unique approach. Nevertheless, our results provide valuable insights into pharmacists' subjective preferences, laying the groundwork for deeper exploration of community pharmacy landscape dynamics.

When comparing chain pharmacies to independent pharmacies, our study did not reveal statistically significant differences in pharmacist evaluations of patient care quality or community service. Nonetheless, findings from a study conducted in China by Xi and colleagues suggested that providing pharmaceutical care poses more challenges for independent pharmacies than for chain pharmacies⁸. Interestingly, Jordanian pharmacists participating in our study asserted that independent pharmacies excel in providing a better quality of relationship with patients, faster services, and more patient consultations compared to chain pharmacies. This aligns with the perspective of Iranian researchers². It's worth noting that our study did not delve into vertical integration or explore differences between rural and urban areas. However, there was a clear consensus among respondents regarding access to medication, particularly for

rare drugs.

From an economic perspective, respondents in the present study overwhelmingly view chain pharmacies as dominant players in the local pharmaceutical market, posing financial challenges for nearby independent pharmacies. These challenges include increased rental costs, strategic customer attraction through events, and preferential pricing on cosmetics and supplements. The perceived facilitations from medical insurance companies further contribute to economic disparities. This resonates with assertions made by Iranian researchers, reinforcing the broader impact pharmacy chains (and drug stores) on the economic dynamics within the pharmaceutical sector².

Since 2004, research consistently shows retail development strains municipal budgets, demanding increased public services²⁴. Big chain stores harm local businesses and property values²⁵. Big chains divert customers from independent local businesses²⁶. Such impact was not unexpected, as confirmed by a 1996 study indicating that 84% of new Wal-Mart store sales displaced existing businesses²⁷.

The present study doesn't definitively determine which model benefits the national economy or is more stable. The recent economic collapse of a major chain significantly influenced perceptions among Jordanian pharmacists. Studies from other disciplines suggest large national chains are more productive and stable than displaced single-unit firms¹. Further research is needed to comprehensively explore the economic impact of chain and independent pharmacies.

The application of official inspections by regulatory bodies is perceived similarly for both chain and independent pharmacies, yet respondents in the present study express dissatisfaction with the existing legislations. A consensus among participants suggests the need for amendments to prevent market monopolization and ensure justice. These findings align with expectations in countries where the chain pharmacy model has been recently introduced². These findings have critical implications for policymakers and stakeholders. To ensure a balanced and sustainable pharmacy sector, regulatory frameworks must be strengthened to promote fair competition, prevent monopolistic practices, and safeguard independent pharmacies from economic disadvantages. Legislative reforms should address pricing transparency, fair market access, and ethical business practices to create a more equitable pharmaceutical landscape. Future policies should also support workforce development, ensuring that both pharmacy models contribute positively to public health and economic stability.

Limitation

The study did not explore the causes behind the collapse of pharmacy chains, as pertinent details for this objective could not be obtained. The research exclusively captures the perspectives of pharmacists, recognizing that viewpoints from patients or other stakeholders may differ. As is customary with survey-based research, the results are contingent on participants' opinions. The possibility of responder bias due to conflicts of interest cannot be ruled out. However, the study's substantial sample size, with a 99% confidence level,



enhances the potential generalizability of the findings. Future longitudinal research is encouraged to explore patient-related outcomes and compare the effectiveness of pharmaceutical care between the two pharmacy models.

CONCLUSION

Chain pharmacy system in Jordan and Middle East is still evolving, facing challenges in establishing its presence in the local market. While chain pharmacies offer advantages in management, work environment, and professional development, concerns about market monopoly, preferential deals, trademark misuse, and unregulated expansion pose risks to market stability. Additionally, legislative loopholes allow certain chain pharmacies to bypass regulations, further complicating the landscape. Addressing these challenges through balanced policies is essential to ensuring fair competition and economic sustainability for both chain and independent pharmacies.

AUTHOR CONTRIBUTIONS

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The final form of the manuscript: All authors.

COMPETING INTERESTS

All authors have no competing interests

References

1. Foster L, Haltiwanger J, Klimek SD, Krizan CJ, Ohlmacher S. The Evolution of National Retail Chains: How We Got Here. SSRN Electron J. Published online March 2015. doi:10.2139/ssrn.2589175
2. Mohammadzadeh M, Yousefi N, Sharifinia H. Chain drugstores: Opportunities and threats. *Iran J Pharm Res.* 2014;13(3):739-742. doi:10.22037/ijpr.2014.1768
3. Arafat N, El Sharnoubi O. The rise and fall of Egypt's top pharmaceutical chain. Mada. <https://www.madamasr.com/en/2021/03/09/feature/economy/the-rise-and-fall-of-egypts-top-pharmaceutical-chain/>. Published March 9, 2021.
4. Salameh D. Big sharks in small market, the collapse of pharmacy one. 7iber publication news. <https://www.7iber.com/politics-economics/ن-و-ي-س-م-ر-ا-ف-ت-ا-ي-ل-د-ي-ص-ق-ل-س-ل-س-ر-ث-ع-ن-ع/>. Published April 20, 2021.
5. Berenbrok LA, Tang S, Gabriel N, et al. Access to community pharmacies: A nationwide geographic information systems cross-sectional analysis. *J Am Pharm Assoc.* 2022;62(6):1816-1822.e2. doi:10.1016/j.japh.2022.07.003
6. World Health Organization. Good Pharmacy Practice in Community and Hospital Pharmacy Settings. Technical Report Series, Annex 7 No. 885,; 1999. https://www.who.int/publications/i/item/WHO_TRS_885
7. WHO/FIP. Joint FIP/WHO Guidelines on Good Pharmacy Practice: Standards for Quality of Pharmacy Services. Technical Report Series, Annex 8 No. 961, 2011.; 2011. <https://www.who.int/publications/m/item/annex-8-trs-961>
8. Xi X, Huang Y, Lu Q, Ung COL, Hu H. Community pharmacists' opinions and practice of pharmaceutical care at chain pharmacy and independent pharmacy in China. *Int J Clin Pharm.* 2019;41(2):478-487. doi:10.1007/s11096-019-00802-w
9. Asif U, Saleem A, Masood I, Nawaz M. Consumers' expectations and experiences with chain community pharmacies in Lahore, Pakistan: a qualitative exploratory study. *Int J Clin Pharm.* 2019;41(3):813-819. doi:10.1007/s11096-019-00841-3
10. Bisharat H, Obeidat BY, Alrowwad A, Tarhini A, Mukattash I. The Effect of Human Resource Management Practices on Organizational Commitment in Chain Pharmacies in Jordan. *Int J Bus Manag.* 2016;12(1):50. doi:10.5539/ijbm.v12n1p50
11. Athiyah U, Setiawan CD, Nugaheni G, Zairina E, Utami W, Hermansya A. Assessment of pharmacists' knowledge, attitude and practice in chain community pharmacies towards their current function and performance in Indonesia. *Pharm Pract (Granada).* 2019;17(3):1518. doi:10.18549/PharmPract.2019.3.1518
12. Bratkowska K, Religioni U, Krysiński J, Merks P. Quality of Pharmaceutical Services in Independent Pharmacies and Pharmacy Chains in Poland from the Patient Perspective. *Patient Prefer Adherence.* 2020;Volume 14:2459-2467. doi:10.2147/PPA.S284014
13. Briesacher B, Corey R. Patient satisfaction with pharmaceutical services at independent and chain pharmacies. *Am J Heal Pharm.* 1997;54(5):531-536. doi:10.1093/ajhp/54.5.531
14. Rashrash M, Sawesi S, Schommer JC, Brown LM. Predisposing, Enabling, and Need Factors Associated with the Choice of Pharmacy Type in the US: Findings from the 2015/2016 National Consumer Survey on the Medication Experience and Pharmacists' Roles. *Pharmacy.* 2021;9(2):72. doi:10.3390/pharmacy9020072
15. Miller R, Goodman C. Do chain pharmacies perform better than independent pharmacies? Evidence from a standardised patient study of the management of childhood diarrhoea and suspected tuberculosis in urban India. *BMJ Glob Heal.* 2017;2(3):e000457. doi:10.1136/bmjgh-2017-000457



16. Jordanian Food and Drug Administration. Jordanian FDA Regulations. Rules and Regulation. Published 2013. Accessed February 4, 2022. <http://www.jfda.jo/Pages/viewpage.aspx?pageID=153>
17. Wilson FR, Pan W, Schumsky DA. Recalculation of the Critical Values for Lawshe's Content Validity Ratio. *Meas Eval Couns Dev*. 2012;45(3):197-210. doi:10.1177/0748175612440286
18. Taherdoost H. Determining Sample Size; How to Calculate Survey Sample Size. *Int J Econ Manag Syst*. 2017;2:237-239.
19. Qualtrics. Sample Size Calculator. Published 2020. https://www.qualtrics.com/blog/calculating-sample-size/?fbclid=IwAR0urxilwycKulxHio2ttEZ_yFvncrYA9BgXCJd5jQJeho2zmzfR4l3z2TU
20. Akoglu H. User's guide to correlation coefficients. *Turkish J Emerg Med*. 2018;18(3):91-93. doi:10.1016/J.TJEM.2018.08.001
21. Pharmacy Guild of Australia. The Quality Care Pharmacy Program (QCPP). Quality Care Community Pharmacy Standard. Published 2017. <https://www.qcpp.com/about-qcpp/what-is-qcpp>
22. Pharmacy Quality Alliance. Pharmacy Quality Alliance Pharmacy Performance Measures. Pharmacy performance measures. Published 2006. <https://www.pqaalliance.org/pharmacy-measures>
23. Community Pharmacy Contractual Framework. Pharmacy Quality Scheme. Quality & Regulations. Published 2021. <https://cpe.org.uk/quality-and-regulations/pharmacy-quality-scheme/>
24. Gross R. Regional Connections: A Growth Strategy for Central Ohio Understanding the Fiscal Impacts of Land Use in Ohio.; 2004. <http://www.sharesimsbury.com/Docs/Fiscal Impacts of Land use in Ohio.pdf>
25. Gsottschneider RK. Understanding the Tax Base Consequences of Local Economic Development Programs.; 2004. <https://www.independentwestand.org/wp-content/themes/iwsv1/documents/AndersonvilleSummary.pdf>
26. OMEGA. What is the impact of "big box" stores on the community? - West Virginia Oil Marketers and Grocers Association. OMEGA.
27. Muller T, Humstone E, Artz GM. National Trust For Historic Preservation.; 1996.

تقييم أثر صيدليات السلاسل على مهنة الصيدلة

* واقع مهنة الصيدلة مهم لكل صيدلاني وصيدلانية وفيه العديد من التحديات المتزايدة.
* نبحث في هذا الجهد وبشكل محايد، حسب الاصول العلمية الموثوقة، جانباً من مهنة الصيدلة و هو: سلاسل الصيدليات و الصيدليات المنفردة في واقع المهنة.
* يشمل هذا التقييم بعضاً من المحاور نرجو منك التكرم باجابتها للمساعدة في تحليل الواقع الصيدلاني و المساهمة في صنع توصيات مدعومة بدليل علمي محايد.
* يستهدف هذا التقييم جمع آراء الصيادلة (الحاصلين على بكالوريوس صيدلة) في جميع مواقع عملهم و يمكن لمساعدتي الصيادلة المشاركة ايضاً.
* لا يوجد في هذا التقييم أي بيانات شخصية، المعلومات المطلوبة هي رأيك الحر و الصادق في موضوع التقييم دون تحديد شخصك.
* المشاركة في هذا التقييم تطوعية و يمكنك في اي وقت الانسحاب

Information obtained from this assessment will be managed according to International * Ethical Guidelines, which was prepared by the Council for International Organizations of * Medical Sciences (CIOMS), in collaboration with the World Health Organization

This effort is managed by Dr Mohanad Odeh and Dr Saja Hamed, as a professional * community service, delivered through Pharmacy Management and Pharmaceutical Care * Innovation Center – Hashemite University / Jordan

*Required

1. * أعلم أن المشاركة في هذه الدراسة تطوعية، و أُرغب بالمشاركة و الاجابة على الاستبيات

Mark only one oval.

- ☐ نعم ارغب بالمشاركة
- ☐ لا ارغب بالمشاركة

Table Supplement 2: Parameters list: the framework of 40 aspects: "Powerful Professional Workers Emerge, Lending Grace" 1)Pharmaceutical care & Patient Services. 2) Professional development and Working environment and. 3) Economic considerations 4) Legal aspects, and 5)General concerns, including preferences.

Pharmaceutical care & Patient Services	
1.	Quality of Pharmaceutical care
2.	Providing Community services, social accountability
3.	Quality of patient counselling
4.	Waiting time for patient service
5.	Securing rarely used medicine
6.	Management of monthly chronic prescriptions
7.	Long term relationship and patients follow up
8.	Physical space (Ergonomics) to deliver programs such as vaccination and training.
Professional development and Working environment	
9.	Work environment
10.	Salaries and Direct financial rewards
11.	Benefits other than direct financial as Health insurance and Social security
12.	Professional Development and Training, Continuing education and Training
13.	Job security
14.	Job openings for pharmacists
15.	Job openings for assistant pharmacists
16.	Inventory Management
17.	Medicines Management
Economic considerations	
18.	Financial goals (Profit aim and save expensive)
19.	Selling non medical items (Quantitative)
20.	Prices of non medical items
21.	Generation of overall income
22.	Contributions to the national economy
23.	Financial Stability
Mega size Privileges and Advantages:	
24.	Collaboration with Insurance companies
25.	Collaboration with Supplier and Wholesalers
26.	Budget for promotion and customer attraction
Impact on market competition (Direct and indirect):	
27.	Direct impact on competitor due to monopoly
28.	Impact based on geographical proximity (the insolvency of nearby independent pharmacies)
29.	Preventing new pharmacists to have their own pharmacies
30.	Impact on rental values for pharmacies.
Legal aspects	
31.	Pharmacy ownership regulations
32.	Adherence to Professional Pharmacies law and regulations
33.	Vacation days vs working days
34.	Daily working hours
35.	Regulations for inheritance and bequeath
36.	Supervisory inspections by health authorities.
37.	Intellectual property and Trademarks

General concerns
38. All at all pharmacists' preferences for the type of pharmacy.
39. Evaluation of pharmacists' opinions on current local legislation and its role in ensuring fairness for all pharmacists.
40. Intention toward future expansion.

Executive Summary of Results

Comprehensive Assessment of Pharmaceutical Care Services, Professional Development, Work Environment, Economic Factors, and Legislative Compliance between Chain and Independent Pharmacies Models

1) Pharmaceutical Care Services & Patient Care

1.A) Parameters with statistically significant differences

1.A.1) Independent pharmacies were favorably perceived compared to chain pharmacies

- Delivering patient counselling (36.3% vs 19.8%, $X^2(1) = 40.7$, $p < 0.001$).
- Serving the patient faster, i.e., less waiting time (40.8% vs 24.3%, $X^2(1) = 35.0$, $p < 0.001$).
- Building better rapport and longer-term relationship (65.3% vs 9.6%, $X^2(1) = 345.9$, $p < 0.001$).

1.A.2) Chain pharmacies were favorably perceived compared to independent pharmacies

- Providing and managing **chronic medications prescriptions** (35.4% vs 26.2%, $X^2(1) = 11.5$, $p = 0.007$).
- Securing **rare medications** (46.9% vs 12%, $X^2(1) = 304.3$, $p < 0.001$).
- Better ergonomics position **to deliver services like vaccination and training** compared with independent pharmacies. $X^2(1) = 189.8$, $p < 0.001$.

1.B) Parameters perceived as similar (No statistically significant differences)

- Quality of patient care**, $X^2(1) = 2.25$, $p = 0.13$.
- Delivering **community services and social accountability** (30.5% chain, 32.2% independent, $X^2(1) = 0.37$, $p = 0.54$).

2) Pharmacists' perceptions of the economic impact of chain pharmacies and independent pharmacies

2.A) Parameters with statistically significant differences

2.A.1) Chain pharmacies were favorably perceived compared to independent pharmacies

- Profit orientation 'Aim to achieve higher profits and save more expenses' (46.2% vs 14.9%, $X^2(1) = 134.6$, $p < 0.001$).
- More interested in selling non-medical products like cosmetics and food supplements (62.9% vs 10.9%, $X^2(1) = 305.8$, $p < 0.001$).
- Prices of non-medication items such as cosmetics and food supplements are higher in independent pharmacies (44.6% vs 21.2%, $X^2(1) = 69.2$, $p < 0.001$).
- Support the national economy (37.6% vs 16.9%, $X^2(1) = 65.8$, $p < 0.001$).
- Overall income generation (72.9% vs 11.0%, $X^2(1) = 381.3$, $p < 0.001$).
- Market monopoly (37% agree and 36% strongly agree, $X^2(1) = 391.9$, $p < 0.001$).
- Chain pharmacies may result in the insolvency of nearby independent pharmacies (agree and strongly agree: 77.2% vs disagree and strongly disagree 8.3%, $X^2(1) = 464.7$, $p = 0.001$).
- Increasing the cost of the rent in the neighborhood areas (agree and strongly agree: 65.1% vs disagree and strongly disagree 8.9%, $X^2(1) = 357.4$, $p < 0.001$).
- Attract customers (seasonal events and marketing campaigns): agree and strongly agree: 78.8% vs disagree and strongly disagree 5.5%, $X^2(1) = 532$, $p < 0.001$).
- Limit opportunities for new pharmacists to establish their own pharmacies (agree and strongly agree: 78.9% vs disagree and strongly disagree 8.1%, $X^2(1) = 503.8$, $p < 0.001$).



- xi. Facilitation and preferential deals from wholesalers (agree and strongly agree: 83.4% vs disagree and strongly disagree 3.4 %, $X^2(1) = 616.3$, $p < 0.001$).
- xii. Facilitation and preferential deals insurance companies as confirmed by the majority of respondents (agree and strongly agree: 82.2% vs disagree and strongly disagree 4.3%, $X^2(1) = 585.2$, $p < 0.001$).

2.B) Parameters perceived as similar (No statistically significant differences)

- i. Financial stability ($X^2(1) = 1.9$, $p = 0.17$).

3) Pharmacists' perceptions of the legislative aspects of chain pharmacies and independent pharmacies

3.A) Parameters with statistically significant differences

3.A.1) Independent pharmacies were favorably perceived compared to chain pharmacies

- i. Compliance with ownership regulation (40.7% vs 18.8% $X^2(1) = 67.4$, $p < 0.001$).
- ii. Easier to bequeath the independent establishment (56.2% vs 12%, $X^2(1) = 239.3$, $p < 0.001$).

3.A.2) Chain pharmacies were favorably perceived compared to independent pharmacies

- i. Assigned **daily working hours** (40.7% vs 17.6%, $X^2(1) = 76.5$, $p < 0.001$).
- ii. Adherence to regulations regarding the use of **trademarks** (48.1% vs 35.3%, $X^2(1) = 67.8$, $p < 0.001$).

3.B) Parameters perceived as similar (No statistically significant differences)

- i. The majority of respondents (41.6%) reported that both types of pharmacies adhere to professional **practice laws and regulations**.
- ii. **Official inspection by the regulatory bodies** is perceived to be applied similarly in both chain pharmacies and independent pharmacies ($p = 0.08$).
- iii. **Comply with the assigned weekly days off** ($p = 0.12$).

4) Quality of working Environment

4.A) Parameters with statistically significant differences

4.A.1) Independent pharmacies were favorably perceived compared to chain pharmacies

- i. **More jobs for** assistant pharmacists (44.4% vs 29.8%, $X^2(1) = 24.0$, $p < 0.001$).
- ii. Chain pharmacies were perceived to have **a higher negative impact on the individual pharmacist's profession** compared with independent pharmacies (60.0% vs 11.5%, $X^2(1) = 274.7$, $p < 0.001$).

4.A.2) Chain pharmacies were favorably perceived compared to independent pharmacies

- i. **Financial benefits** for the employee, (60.2% vs 15%, $X^2(1) = 227.5$, $p < 0.001$).
- ii. **Health insurance and social security** benefits (71.3% vs 6.3% $X^2(1) = 458.1$, $p < 0.001$).
- iii. **Job security** (42% vs 22% $X^2(1) = 51.4$, $P = 0.001$).
- iv. **Employee professional development and training** (59.5% vs 14.3% ($X^2(1) = 231.9$, $p < 0.001$).
- v. **More job opportunities for pharmacists** (74.6% vs 7.8%, $X^2(1) = 452.6$, $p < 0.001$).
- vi. **Inventory management** (64.1% vs 11.6%, $X^2(1) = 303.5$, $p < 0.001$).
- vii. **Advanced procedures for medicines management** (58.1% vs 13.3%, $X^2(1) = 234.7$, $p < 0.001$).

4.B) Parameters perceived as similar (No statistically significant differences)

- i. **Working environment** for the employee.

5) All preferences:



1. Pharmacy Preference

- The majority of respondents (43.7%) favour independent pharmacies over chain pharmacies (29.5%, $X^2(1) = 23.2$, $p < 0.001$).

2. Future Market Dominance

- Respondents foresee a preference for independent pharmacies dominating the market (43.8%) over chain pharmacies (18.3%, $X^2(1) = 87.4$, $p < 0.001$).

3. Legislation and Market Concerns

- Over 70% of respondents, irrespective of their job sector, believe that current legislation is insufficient, calling for amendments to ensure justice and prevent market monopolization.

6) Demographic preferences

Gender, workplace, and qualification exhibited no significant association ($p > 0.05$) with pharmacy model preferences. However, older participants and those with increased years of experience demonstrated a very strong statistically significant association toward preferring independent pharmacies ($p < 0.001$, Cramer's V (ϕ_c) for age $> 48 = 0.7$) and experience ($p < 0.001$, (ϕ_c) for > 6 -year experience = 0.52). Overall, independent pharmacies were favoured over chain pharmacies (43.7% vs 29.5%, $p < 0.001$).

Supplement 4, Figure The existing regulations are well-established and promote fairness between chain pharmacies and independent pharmacies.

