

RESEARCH ARTICLE

Locum model for pharmacists: A quantitative research study

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Objective: This study aimed to explore the feasibility and impact of implementing locum pharmacist models in Romanian community pharmacies, in the context of growing workforce shortages and operational challenges in the pharmaceutical sector.

Methods: A cross-sectional survey was conducted using a 15-question structured questionnaire distributed via a national locum platform and professional forums. A total of 116 valid responses were collected. The questionnaire covered demographics, professional preferences, and financial expectations. Data were analysed using statistical software to identify correlations between variables such as professional experience, interest in locum work, and expected remuneration.

Results: Respondents represented a diverse age and experience range, with the majority having between 10 and 20 years of professional experience. Community pharmacy was the dominant area of current employment (76%). Most pharmacists reported difficulty in finding replacements during leave, particularly in rural areas. Over half expressed willingness to work locum shifts if adequately compensated, preferring hourly rates 50% to 100% higher than standard wages. Data indicated a correlation between years of experience and higher salary expectations. The study highlighted distinct professional preferences between administrative and patient-facing roles and emphasised the stress associated with excessive workloads and reduced rest periods.

Conclusions: Locum work presents a viable solution to mitigate staffing shortages in Romanian pharmacies, offering flexibility and increased earning potential for pharmacists. However, challenges such as professional isolation, inconsistency in pharmacy systems, and lack of formal support must be addressed to optimise implementation. Integration strategies and legislative clarity will be essential for the long-term success of locum models in the pharmaceutical sector.

Keywords: pharmacist, locum pharmacist, human resources, pharmaceutical workforce, Romania, professional flexibility

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Introduction

In an ever-changing world, the pharmaceutical industry faces variable demands and unforeseen challenges. Effective human resource management in a pharmacy is becoming crucial to ensuring quality pharmaceutical services and customer satisfaction. In this context, the concept of “locum” is becoming increasingly relevant to pharmacies around the world. The need or desire for flexibility was the predominant factor for choosing to work as a locum, but the desire to find work-life balance was fundamental for many pharmacists.

In recent years, a new form of employment has come to the attention of the pharmaceutical industry - locum jobs. These short-term contracts give pharmacists the opportunity to work temporarily in a pharmacy, replacing a pharmacist who is permanently employed during periods of unavailability, such as medical or rest leave. The operation of replacing permanent staff with locum professionals may seem simple at first glance, but this solution brings with it several advantages, disadvantages, challenges, and opportunities for both parties involved. The locum model is not alien to the Western world, having been in the health

sector in Western European countries for decades, but also in the United States and Australia, being applicable to both doctors and pharmacists. For example, in the United Kingdom, around 30% of the operating hours of pharmacies are covered by locum pharmacists, providing a conclusive model that can be adapted and implemented in other geographical areas [1].

This form of human resource optimisation in the pharmaceutical industry opens new horizons and development opportunities for pharmaceutical businesses. By adapting and implementing this model, pharmacies can modulate various parameters, including the operating schedule, employee count, and financial aspects like productivity and profitability. Outside the pharmaceutical industry, the concept of locum can be successfully adapted and applied in various sectors of the liberal professions, where accredited professionals operate based on the provision of services specific to their expertise, without being tied to a permanent employer. Through locum jobs, significant opportunities are created for the professionalism of pharmacists and the efficiency of pharmacies, offering a winning solution to all parties involved in this temporary collaboration.

The study by Lynch and O’Leary (2023), conducted in the UK, explores factors influencing pharmacist retention

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in community practice. Many pharmacists chose locum roles due to dissatisfaction with permanent positions, citing high administrative burdens, commercial pressures, and poor working conditions. Locum work was seen to offer greater autonomy, flexibility, and work-life balance. However, it also came with downsides such as professional isolation, lack of training opportunities, and reduced career development. The study highlights systemic issues in the community pharmacy sector that push professionals toward more independent, yet less supported roles like locums [2].

Across Europe (based on the latest ReportLinker and OECD data), the average density of practising pharmacists is approximately 0.81 per 1,000 inhabitants (about 81 per 100,000), as of 2019 (covering 21 countries) [3]. In 2023, the density of practising pharmacists differs significantly across Europe. Belgium has the highest rate with 1.34 pharmacists per 1,000 people, while Romania follows with 1.29 per 1,000, according to the ReportLinker [4].

The average density of community pharmacies in the European Union is approximately 25 pharmacies per 100,000 inhabitants, with significant variation between countries. Southern European countries, such as Spain and Greece, exhibit higher densities exceeding 60 pharmacies per 100,000 inhabitants, whereas Northern European countries like Denmark and Sweden report densities below 15 per 100,000. Romania's pharmacy density stands at around 30 pharmacies per 100,000 inhabitants, placing it above the EU average but below the southern European leaders. These disparities reflect differences in regulatory frameworks, healthcare delivery models, and market dynamics across the region [5]. By linking these data, we can see that the number of pharmacists is decreasing, and the number of pharmacies, although also decreasing, is still above the European average. There is a need for an efficiency of human resources among pharmacists and, implicitly, an opportunity for testing modern forms of work like the locum model.

A British study indicates that pharmacists often prefer locum positions due to flexible scheduling, higher hourly wages, and the opportunity to gain diverse professional experience, despite potential job insecurity and lack of employment benefits [6]. Community pharmacists (CPs - community pharmacists) have also been shown to experience increasing stress from high workloads, the perceived need to deliver services more quickly to patients, and the expansion of CPs' roles, but without the level of control that an appointment system affords general practitioners (GPs - general practitioners), nurse practitioners (NPs - nurse practitioners) [7]. A professional satisfaction survey from 2016, involving 500 respondents from these three categories, highlighted that pharmacists had the highest rates of working while ill (64.4%) and not taking adequate leave [8].

An Australian study from 2024 looked at the employment and job selection factors of pharmacists, including

those who choose such jobs as locum. These factors included financial income, incentives, and relocation allowances. It was highlighted that mobile pharmacists placed particular emphasis on financial compensation, often exceeding the average salary, in some cases, receiving more than twice the standard remuneration [9]. The second group of advantages encompasses practice autonomy and breadth of tasks. These factors relate to the ability of pharmacists to be independent, have opportunities to direct their own practice, while also having variety that will promote job satisfaction [10]. It was shown that candidates are drawn to pharmacies or health services where an opportunity to be autonomous exists or is promoted, and where a high level of control over their own practice is viewed as an advantage [11]. Yet, nowhere is it easy to find a locum in the countryside. For some, getting locum coverage was challenged by both the direct cost of the locum and the location of their practice relative to a significant population centre [12]. For example, a participant stated, "... if I want to get a locum, they will not come for [dollar amount] an hour, and even if you offer [double], they won't come to smaller places. They don't like to travel too far. This sentiment was further explained by another participant: We've actually had nobody apply ... you know people [ask] ... 'How far are you from [the city]?' ... Our issues have always been about location" [9]. Conversely, others described positive experiences with locums who have built up a rapport with their community over several years and know how to manage the service. In one case, the locum became the hospital's pharmacist after the previous pharmacist's retirement [13]. It was suggested that the diversity of practice in rural and remote workplaces, compared to more metropolitan areas, enables the development of early-career pharmacists or those seeking to work more rurally [14].

In this paper, the applicability of this system will be analysed in Romania, the first platform that tries to implement the concept in pharmacies in Romania, and the composition of an ideal profile of the Romanian locum pharmacist based on common characteristics extracted from a market survey.

Materials and methods

To gain a more detailed understanding, we utilised the access provided by the 3rd Job Locum platform to conduct a study of the pharmacists who are members of the platform, specifically the pharmacist representing pharmacies. Additionally, through this paper, we carried out a market study. Starting from the premise that there are undoubtedly several peculiarities specific to this category, including age, experience, job preferences, and hourly payroll rates. All this data was collected through a questionnaire sent to the platform community and professional groups of pharmacists, and the results will be analysed using a statistical programme.

The 1KA OneClick Survey software was used for the questionnaire. A series of 15 questions divided into 3 categories was formulated, namely demographic data, financial

aspects, and professional satisfaction. The questionnaire was tested with 5-8 people. The questionnaire was sent to the 3rd Job Locum platform database, which comprises 500 registered pharmacists, and was also posted on two professional forums for pharmacists. Following this distribution, 116 valid and complete answers were obtained. For the analysis of the results, the statistical analyses generated by the 1KA OneClick Survey were used according to the requested parameters. The following data have established relations of dependence between the criteria pursued, and in this article, these variables will be interpreted.

Results

Most respondents in the age group were between 31 and 40 years old (36%), while the categories 20-30 years (27%) and 41-50 years (27%) were similar in size. The lowest percentage was in the 51-60 years category, with no responses from pharmacists over 61.

In the second question, the distribution of pharmacists was analysed according to the level of professional experience in the pharmacy (Figure 1). The largest category, with 28%, had between 10-20 years of experience, and the category found the least was the one with less than 1 year of experience (7%).

Additionally, the complexity of the pharmacy profession should be considered, as pharmacists have the possibility to work in multiple sectors of activity within the profession. To address this, we formulated a question, and the results indicate that pharmacists interested in the locum regime primarily work in community pharmacies (76%). Among the mentioned sectors of activity are pharmacists from the hospital pharmacy (9%), pharmaceutical industry (5%), education (1%), and a cumulative 10% divided in clinical pharmacy, drug distribution chain and pharmaceutical warehouses, medical representative, scientific research, health inspectorate, pharmaceutical legislation – regulatory affairs, manual software tester for pharmacies.

In the following question, we aimed to maintain the respondents' current position in the pharmacy. According to Figure 2, half perform as pharmacists while a high percentage, 36% have the status of chief pharmacist. Only 3% have mobility experience.

Locum jobs present multiple challenges for professionals, and we aim to identify the differences in preferences among pharmacists regarding administrative and patient tasks. Analysing the interest in new jobs, Figure 3 was obtained.

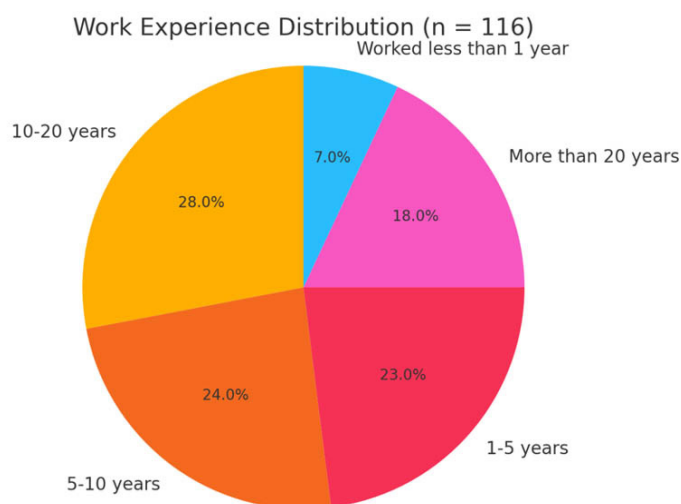


Fig. 1. Background of professional experience in pharmacy of participants

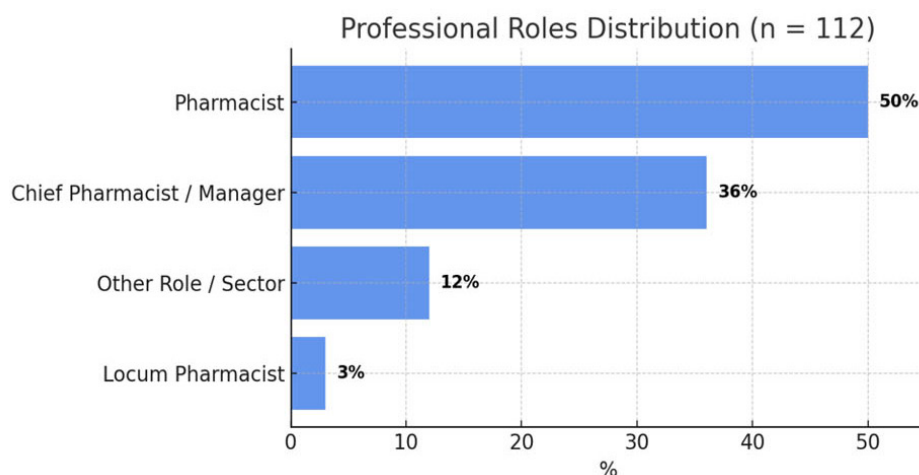


Fig. 2. Breakdown of the actual role of participants

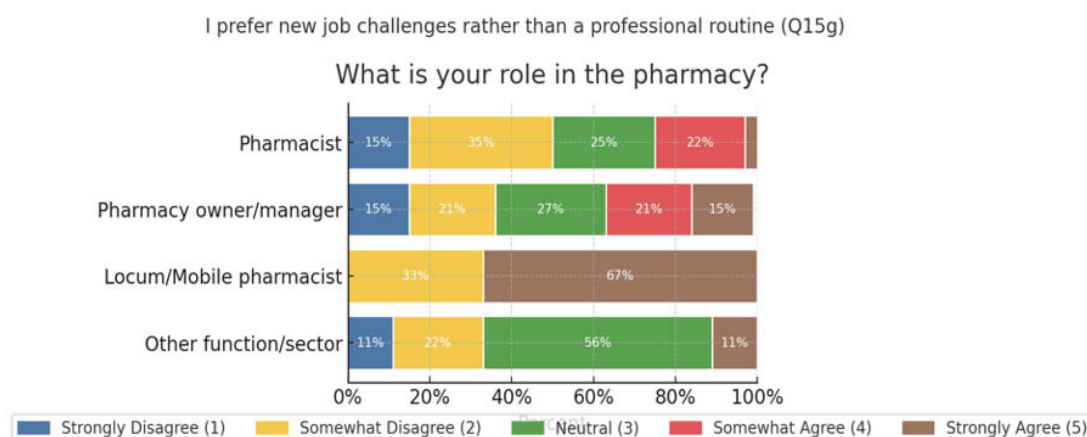


Fig. 3. Breakdown work position/new jobs interest

Figure 4 shows that regardless of professional experience and years of activity in the pharmacy, the majority percentage is that of pharmacists who have had problems finding a replacement, in some categories, the percentage is even more than double that of those who have encountered such problems.

When asked “Did I have problems finding a replacement pharmacist when I wanted to go on vacation?”, of the pharmacists in urban areas 26% were totally in agreement, and 30% somewhat agreed. Rural pharmacists were

50% totally agree and 20% somewhat agree. A very small percentage, cumulatively of 13%, disagreed, accentuating the gravity of the situation.

Another common situation in which the effect of staff shortages is felt is that of working hours outside the pharmacist's basic schedule, namely weekend periods, legal holidays, national days off, or night guards. To study the opinion and perspective of pharmacists on these periods, the subject was addressed in two questions transposed in Figures 5, 6, and 7, which we will analyse.

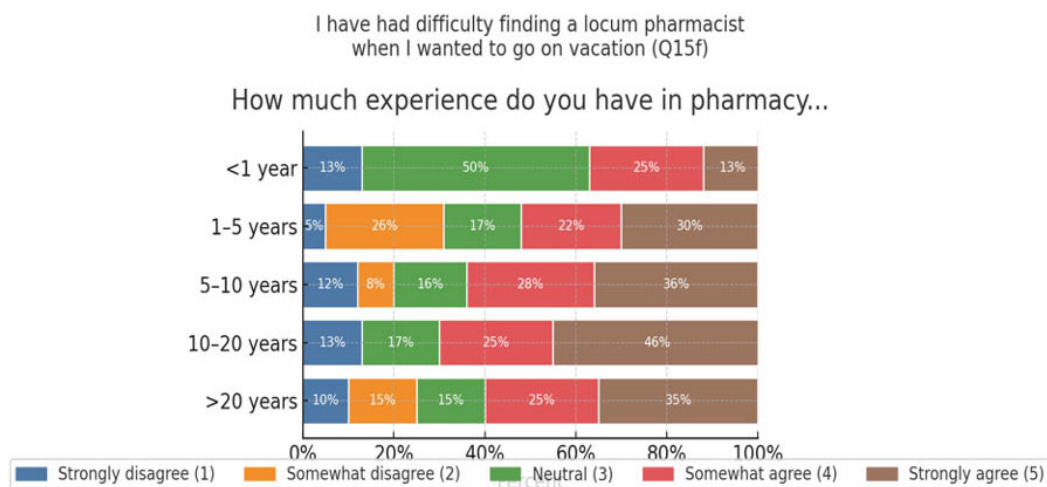


Fig. 4. Work seniority of participants vs difficulty in finding a solution to fill-in a vacancy

On average, per month, how many times do you work on weekends/public holidays? (n = 112)

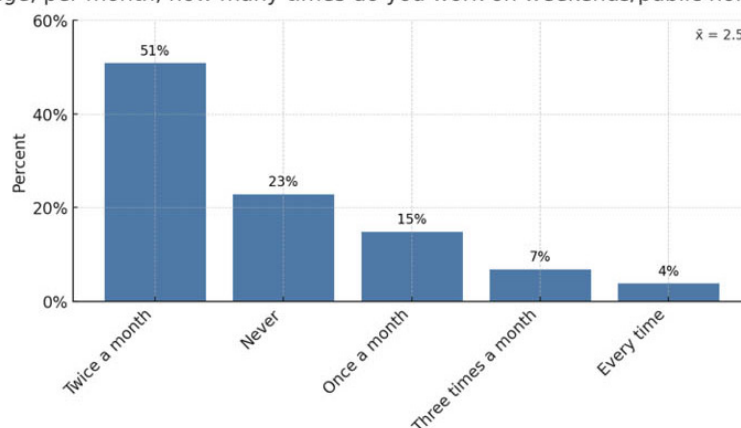


Fig. 5. Frequency of how many times participants worked during weekends/public holidays monthly

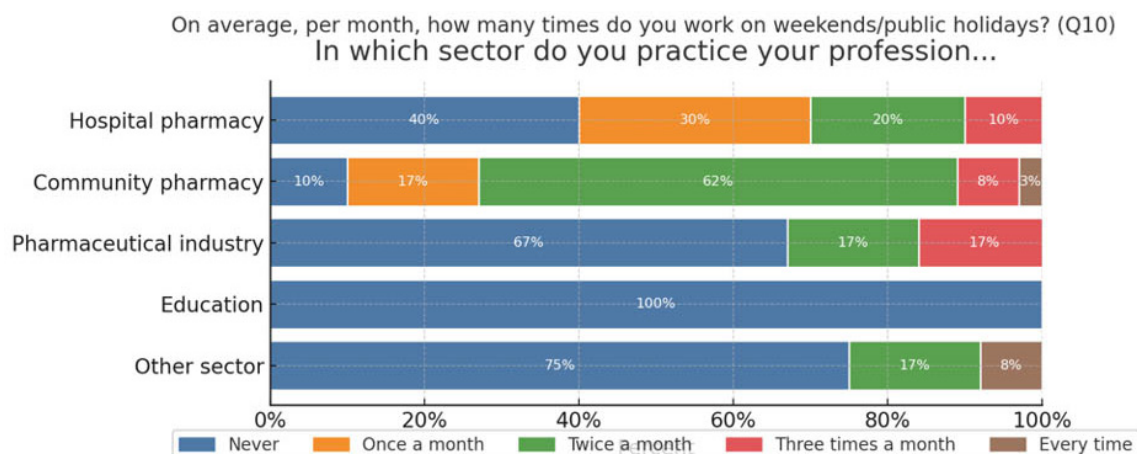


Fig. 6. Average weekend/public holidays days participants were on duty per month

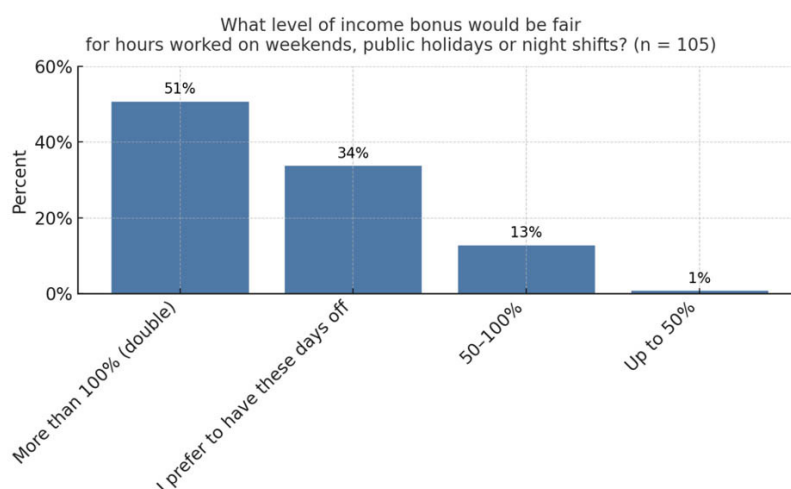


Fig. 7. Revenue expectations of pharmacists for working during weekends/public holiday day shifts

We had analysed the costs that pharmacies would face for these services or, more precisely, the salary expectations among potential locum pharmacists (Figure 8 and 9).

To the question “If you worked as a replacement pharmacist, which option would represent the expected, realistic income?” 61% responded that they expect an hourly income up to 50% higher than that of an employee (similar to weekend work). 28% replied that they expect an hourly income 100% higher than that of an employee

(similar to working on legal holidays) and 11% expect an hourly income similar to how much they earn as employees.

We find direct proportionality between years of professional experience as a pharmacist and expected net income. The tendency of each category is to benefit from better salaries than at present for their category of experience. The salary is expected to increase over time with experience, which is not happening much at present (Figure 10).

What was the category of your monthly average income from pharmacy activities in the last calendar year? (n = 105)

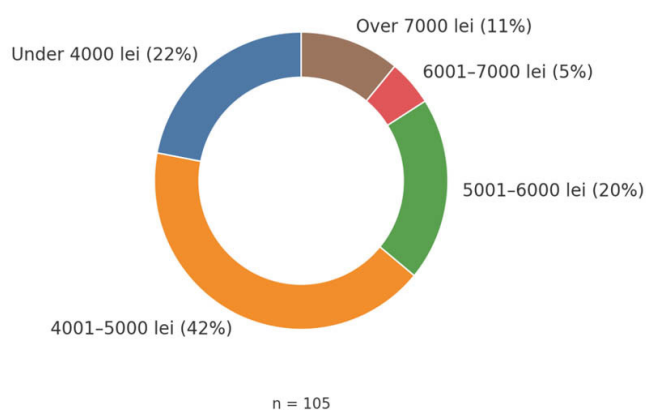


Fig. 8. Frequency of the current net revenue of participants

What would be the correct level of bonus per hour for a pharmacist? (n = 105)

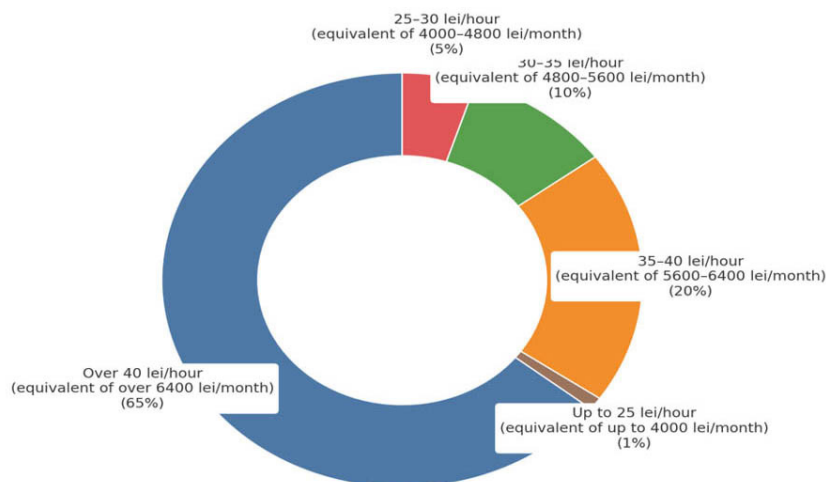


Fig. 9. Breakdown of expected revenue per hour

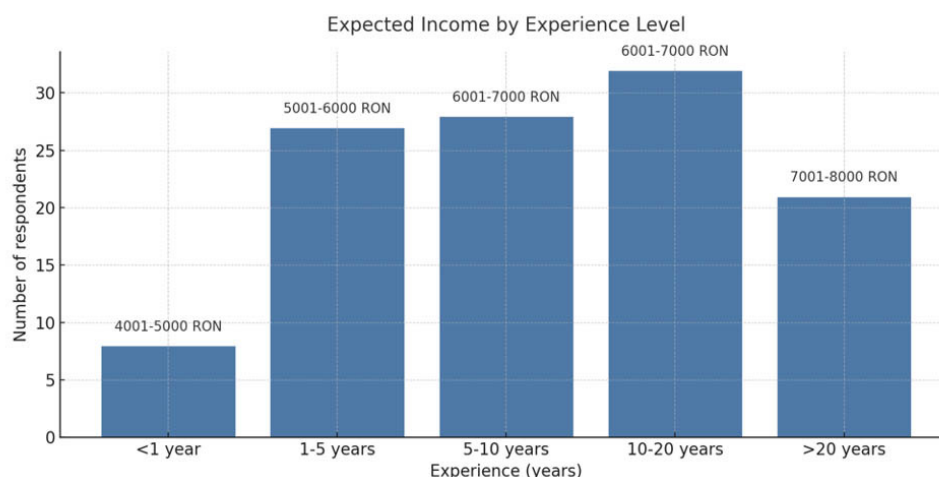


Fig. 10. Distribution of revenue expectation vs professional experience

Discussions

The majority age category of respondents was between 31 and 40 years old, but are also present in equal weight categories 20-30 years and 41-50 years, which denotes that the age of pharmacists is not a barrier or a defining factor in the interest of work in the locum regime.

In support of this first finding is the more balanced distribution of professional experience in Community pharmacy, with the highest percentage being those with 10 to 20 years of experience (Figure 1). A first conclusion addresses the concerns of pharmaceutical employers regarding the experience and competence of locum pharmacists who work temporarily in their pharmacies. It is noted that the highest percentage of pharmacists' responses attests to 10-20 years of experience in the community pharmacy, and the category with the least experience, namely under 1 year, is in the last place, at a great distance from the previous categories. Comparing the two extreme categories mentioned, it is noted that in relation to the total number of study participants, there are 4 times more pharmacists with experience between 10 and 20 years than those with experience under one year.

Additionally, the complexity of the pharmacy profession should be considered, as pharmacists have the possibility to work in multiple sectors of activity within the profession. To address this, we formulated a question, and the results indicate that pharmacists interested in the locum regime primarily work in community pharmacies (76%). However, given the constantly growing shortage of pharmacists in pharmacies, locum jobs open the opportunity for a wide range of professionals to temporarily fill this shortage of staff. Analysing the result obtained at this determination, excluding the 76% who are already employed in pharmacies, 24% of respondents are interested in locum jobs even if they work in another sector of the pharmaceutical profession, being a significant resource of personnel not used in pharmacy until now. Among the mentioned sectors of activity are pharmacists from the hospital pharmacy, clinical pharmacy, pharmaceutical industry, education, drug distribution chain, pharmaceutical warehouses, medical representative, scientific research, health inspectorate, pharmaceutical legislation – regulatory affairs, and manual software tester for pharmacies. In addition to the responses mentioned by respondent pharmacists as a sector of activ-

ity, some Romanian pharmacists working exclusively in the UK provided positive feedback.

We see that pharmacists who are currently working within community pharmacies are the main category eligible for locum supplementation. There is a general tendency among pharmacists to separate administrative activities from patient counselling at the top of the preferences. As a distribution after the position occupied in the pharmacy, there is also an increased interest from the leading pharmacists, representing 36% of the total respondents (Figure 2). Half of the respondents, 50%, currently serve as pharmacists, but considering their work experience, the administrative skills needed by the chief pharmacists are higher among potential locum pharmacists which gives them an extra asset in managing unforeseen challenges or sites that may occur during a job locum even if the work environment is not a familiar one every day.

Locum jobs are inherently challenging for every professional because they tend to take the pharmacist out of their comfort zone. Therefore, adaptability and curiosity about new roles are also important. Analysing Figure 3 confirms differences in pharmacists' preferences regarding administrative or patient-related burdens. Pharmacists who already have experience as mobile or locum pharmacists, as well as those working in sectors outside of community pharmacy, show the greatest openness to new experiences, generally agreeing with the idea of trying new roles rather than sticking to a routine. Conversely, chief pharmacists are more associated with stable positions and are more reserved about exploring other job opportunities. However, this is not necessarily negative; it may reflect a strategic human resources approach where a pharmacy functions optimally with a chief pharmacist focused on administrative management and the regular use of a locum pharmacist when needed. Typically, such a pharmacist would not become a full-time employee but would, at a fair price, accept this challenge. This approach helps maintain programme continuity, balancing patient care and management by deploying the right personnel for each purpose and effectively utilising external staffing resources.

The main challenge faced by small companies is managing leave periods or unforeseen situations where the titular pharmacist cannot be present at the programme. This issue is also constantly experienced by pharmacists, whether due to personal leave or the need to substitute an absent colleague. Figure 4 shows that, regardless of professional experience or years working in the pharmacy, the majority of pharmacists have encountered problems finding a replacement. In some categories, the percentage is even more than double that of those who have faced such difficulties. This indicates that substituting pharmacists remains a longstanding and ongoing problem for community pharmacies, highlighting once again the importance and absolute necessity of a locum labour system.

The problem of replacing a pharmacist is more pronounced in rural pharmacies compared to urban ones.

One possible reason is that most rural pharmacies are independent, so they cannot assign a pharmacist from elsewhere as chain pharmacies often do. For these pharmacies, locums are the solution, allowing them to call in an outside pharmacist for a fixed period.

It is noted that the most common frequency with which pharmacists work on legal days off (Figure 5) is twice a month, while 23% of respondents do not work on these days. However, when considering the sector of activity, a significant discrepancy emerges among the pharmaceutical sectors. Pharmacists in community pharmacies generally have significantly fewer days off compared to other sectors (Figure 6), with cases, including 4%, where the pharmacist works every time. Only 10% of respondents state they do not work on their days off, whereas in other categories, the percentage hovers around 50% or more. Clearly, the situation seems unfavourable for pharmacists in the community pharmacy sector, and this could trigger a chain reaction, from professional exhaustion and dissatisfaction among pharmacists to reduced performance and declining business results.

It was analysed what the expectations and perspectives of pharmacists are in these cases. Analysing Figure 8, we see that pharmacists are divided into two main opinion groups regarding expectations. 51% of respondents would still work today if they were paid correctly, which from their perspective means at least double the current hourly rate. However, the more intriguing part is that among pharmacists who wish to be free during these periods regardless of their pay, 34% are active in community pharmacy, compared to only 10% who are free at the time of the study.

At this point, a challenge emerges for human resources managers, pharmacy owners, and employers in general regarding how to manage this situation so that the pharmacist is satisfied without disrupting the pharmacy programme. At first glance, a simple solution seems available: those who seek additional income will work, while those who prefer more free time will take time off, based on each pharmacist's preferences and priorities. However, the issue becomes clearer when considering the typical size of a pharmacy team, which is most often 2 or 3 pharmacists. For example, if a pharmacy operates with a short weekend schedule, public holidays, and a night shift on rotation, and the team consists of two pharmacists—one who prefers to have days off and another who wishes to work extra twice a month—how will the manager handle this? Will they negotiate a compromise with the pharmacists or close the pharmacy on those days? Both options involve some loss, and the lesser evil will likely be chosen. But what if an external pharmacist, a locum, is brought in—someone who does not work permanently in a community pharmacy but seeks experience and extra income for a few days each month? This is where the value and utility of a locum system come into play, facilitating connections that benefit both parties and utilising resources that might otherwise be overlooked.

Starting from the average salary (Figure 8) in which pharmacists are currently part of the study and comparing it with the financial expectations they have (Figure 9), there is also a discrepancy between expectations and reality, an aspect that has been otherwise known and discussed for many years. Thus, the salary criterion is not a factor that depends on the approach of the locum system, but depends on the salary policy practised by pharmaceutical companies at the national salary average.

It was also important to understand the expectations of a pharmacist who wishes to work as a locum. To provide an objective and realistic analysis of these expectations, we presented the responses in percentages relative to the basic salary rather than in monetary terms. Comparing Figure 8 with Figure 10 confirms the similarity of expectations between working on legal days off and in the locum regime. Pharmacists who prefer to work as locums mostly expect the hourly rate they will be paid to be similar to weekend or overtime hours, meaning a 50-100% difference between the employment hourly rate and the locum hourly rate. Therefore, for the pharmacy manager, hiring a locum instead of closing the pharmacy for a day or period of leave, or operating illegally without a pharmacist, involves gross costs equivalent to paying the titular pharmacist on a day off, which is double the tariff of employment.

We find direct proportionality between years of professional experience as a pharmacist and expected net income. The tendency of each category is to benefit from better salaries than at present for their category of experience. The salary is expected to increase over time with experience, which is not happening much at present.

Analysing the current situation of the Romanian pharmacy labour market and the challenges faced by employers in this sector, we observe notable similarities with the studied Western countries. The number of pharmacists in Romania has been decreasing rapidly in recent years, with waning interest in the profession evidenced by fewer students and graduates each year. I emphasise the strict legislative framework that makes the operation of a pharmacy conditional upon the mandatory presence of at least one pharmacist throughout the entire working hours. In this context, pharmacists are becoming an increasingly scarce resource, and making more efficient use of pharmacists is becoming a priority for pharmacies.

This concept is not new to European pharmacies. A key finding from the first census of the workforce among British pharmacists since 2002 was that a significant proportion of pharmacy staff in Great Britain consists of pharmacists working as locums. Of pharmacists registered as residing in England, Scotland, and Wales who were actively working, 28% reported working as locums. This percentage rose to 38% when considered as a proportion of the workforce in the community pharmacy sector [15].

A 2019 market study in the Netherlands surprisingly emphasises that among pharmacists working in community pharmacies in the country, locum pharmacists have

the highest level of professional satisfaction. Pharmacists who spend more time advising patients tend to be more often locum pharmacists. In the Netherlands, whenever a locum pharmacist is present, there is always a permanent pharmacist working in the pharmacy. Therefore, this could be an effect of task delegation, where the permanent pharmacist primarily focuses on activities related to pharmacy management, and locum pharmacists mainly concentrate on patient counselling (CPS) [16]. In another study, results showed that Dutch community pharmacists spend less time on managerial activities when dedicating more time to cognitive services (from 25.7% to 14.5%, $p=0.016$) [17]. As identified in our own survey, this distinction among pharmacists is also evident in Romania, with some pharmacists focusing more on management and others on patient care. Both categories can be highlighted through Locum, and pharmacies with a staffing shortage can even operate with a single manager supplemented by locums.

It is observed from the examples of the above-mentioned countries that locum pharmacists are often employed as human resources for short-term staff replenishment at various pharmacy sites. However, due to their mobility, one common concern among employers is the performance of these pharmacists in new work environments [18]. A study evaluating the performance of community pharmacists in the United Kingdom highlighted the competence of locum pharmacists, likely due to their experience in different settings, which, although lacking very clear indicators of performance measurement, generally does not fall significantly below the productivity of permanently employed pharmacists. Employers have emphasised adaptability as a more critical criterion than sales targets. The performance of locum pharmacists has often been informally assessed by employers and contractors through peer discussions and customer complaints. For locum agencies, performance evaluation was based on reactive feedback from employers to identify underperforming locums, feedback that, according to the authors, was often unavailable [19].

The future of the pharmacy profession and concerns about professional identity have been common and recurring themes in professional journals and at international pharmacy conferences for over 30 years. These insights offer an understanding of current work patterns and their implications for the future role of community pharmacists. It seems that a significant and influential modern trend in work organisation today is mobile work, non-standard employment that encourages and depends on a flexible and adaptable workforce [20].

The market research we conducted in Romania highlights an increasing interest among pharmacists in using a locum system. They seek a clear context and fair remuneration, proportional to the effort involved. While it is successful in other European countries, this does not guarantee it will work equally well in Romania. However,

it could be a solution worth considering for pharmacies facing a persistent shortage of pharmacists, a crisis projected to worsen in the coming years. Among the obstacles identified are unclear legislation, even when pharmacists have liberal status, along with numerous differences between pharmacy operations, management software, and procedures, as well as the commercial disparities between pharmacies.

Conclusion

This study explored the locum phenomenon in the context of temporary employment in the European pharmaceutical sector and its significance for Romania, emphasising both the potential advantages and the challenges that accompany this form of work. Our analysis suggests that locum employment may offer enhanced flexibility for pharmacists, facilitating a more favourable balance between personal and professional responsibilities. This level of flexibility could be very useful in a field where there is a lot of demand and stress all the time.

However, the practical study conducted among pharmacists in Romania also highlighted several challenges related to locums. The primary issue is the lack of continuity in patient relationships, which can negatively impact the quality of pharmaceutical services, as well as the initial absence of ongoing locum positions for pharmacists. Integration into a new work environment and adapting to different teams and procedures can also pose significant obstacles for pharmacists. Job security concerns and social benefits are less favourable compared to permanent employment, which may influence the decision to choose this employment type, initially seen as a more suitable part-time option. The issues surrounding leave and legal days off pose a significant challenge for pharmacists in Romania. Locums may offer a solution by providing an easier way to find replacements without incurring financial costs for the pharmacy.

Overall, these findings provide preliminary evidence that locum work may represent a feasible option for addressing some workforce challenges in the Romanian pharmaceutical sector. However, further research is needed to better understand its long-term sustainability and impact on service quality. Future steps could include pilot implementation in community pharmacies, alignment with employment and healthcare policies, and comparative studies across European countries to identify best practices.

Authors' contributions

ASA – Conceptualization; Data curation; Formal analysis; Methodology; Project administration; Resources; Validation; Visualization; Writing – original draft

MCC - Supervision; Methodology; Validation; Visualization; Writing – review & editing

Conflict of interest

None to declare.

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