



## Determination of Seasonal Demand for Pharmaceutical Staff

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### ABSTRACT

This research attempts to address the main objectives of personnel management in the field of pharmaceutical activity – the quantity of employees, their qualification, when and where they are required. The purpose of the planning of staff requirements is to properly organize a long-term work with the personnel. Due to the fact that pharmacy organizations observe a seasonal workload associated with the outbreaks of epidemic diseases (such as influenza in winter, gastrointestinal diseases in summer, especially peculiar to the region under study), we calculated additional seasonal demand for specialists. A seasonal factor implies the outbreaks of certain diseases in a certain period of the year, leading to an increase in sales and a further need for pharmacists.

**Keywords:** personnel management, demand for staff, planning, pharmaceutical personnel, seasonal diseases.

### INTRODUCTION

Over the past hundred years, the place of personnel management in the management system has been repeatedly changed. Views, approaches and theoretical concepts of scholars and practitioners working in the personnel management have been revised in the process of social development. The improvement of production, information and management technologies, as well as re-evaluation of the relation of individual and universal values, harmonized the relationship between man and organization.<sup>1</sup>

The evolution of personnel management from the usual work with personnel to human resources management, currently peculiar to domestic pharmaceutical companies as well, implies the development of pharmaceutical personnel management as a science. Therefore, the study of personnel management in pharmacy must take into account peculiarities of the pharmaceutical sphere of economic and social aspects. The analysis of personnel management, as noted by a number of authors, is a complicated task that requires the involvement of highly qualified specialists in various spheres of economy and science.<sup>2</sup>

Three main approaches can be distinguished in the emerging theory and practice of pharmaceutical personnel management in modern conditions<sup>3</sup>:

- economic;
- organic;
- humanistic.

The economic approach is connected with the concept of labor resources used in the field of pharmacy. This approach implies the following principles:

- ensuring the unity of pharmaceutical personnel

management (employees receive orders from one superior only);

- maintaining a strict management vertical (downward management chain from the superior to the subordinate throughout the pharmaceutical company used as a channel for communication and decision making);
- establishing the necessary and sufficient control volume;
- achieving a balance between authority and responsibility in a pharmaceutical company;
- ensuring discipline (obedience, diligence and manifestation of outward signs of respect should be carried out in accordance with the established rules and practices in a pharmaceutical company);
- ensuring the subordination of individual interests to those of the collective.<sup>4</sup>

In the context of the organic approach, the concept of pharmaceutical personnel management combines with that of human resource management.

The personnel function is transformed from registration and control into search and selection of employees, career planning of experts important for the organization, evaluation of employees, increasing their skills.

The organic approach includes the following principles:

- the need to focus on the environment in which a pharmaceutical company functions;
- a pharmaceutical company must be presented as a set of interrelated subsystems, between which it is necessary to maintain a balance and eliminate dysfunction.



The humanistic approach in pharmaceutical personnel management is associated with the understanding of a pharmaceutical company as a cultural phenomenon. At the same time, this culture should be considered in the context of the development standards, reflected in the system of knowledge, ideology, values, and daily rituals.

As described above, personnel management in pharmacy in the broad sense should be seen as a set of ethical principles and norms which need to be followed by employees of pharmaceutical structures (regardless of the position taken up in the management hierarchy) in the pharmaceutical business. This includes issues of different scales: internal and external policies of the pharmaceutical subject in general, professional ethics, psychological climate in the work-setting, business ethics standards, and others.<sup>5</sup>

On this basis, the following regulators in the system of personnel management in pharmacy can be distinguished:

- ethical principles prevailing in the external environment of the pharmaceutical market;
- normative acts, regulating the conduct of employees of the pharmaceutical structure, including public service standards, functional and job descriptions;
- team of employees of the pharmaceutical company;
- individual motives of employees of the pharmaceutical company.<sup>6</sup>

High professional core of human capacity is a major competitive advantage for any company, because the pharmaceutical personnel constitutes the main advantage of the organization in the field of medicines.

Personnel management in pharmacy ultimately aims to achieve two strategic objectives<sup>7</sup>:

- to create competitive advantages of the pharmaceutical company by increasing the level of responsibility of its employees, attracting and retaining professional performers. The fruits of their labor create the high reputation of the pharmaceutical company and attract new customers and highly skilled workers. It is necessary to ensure a feedback between pharmacists and consumers. The involvement of personnel in the marketing activities of the pharmaceutical company contributes to enhancing their initiative and level of professional self-esteem;
- to provide competitive advantages of the pharmaceutical company by building its human capital and constantly stimulating the growth of professional competence of its employees.

Human capital is the stock of knowledge, skills and motivations possessed by each employee of the company. Education, the accumulation of professional experience, health, geographical mobility of personnel

and other similar factors serve as investments in human capital.<sup>8</sup>

In this regard, in recent years, the concept of human capital has taken a central place in the ongoing researches on personnel management. In accordance with it, the effectiveness of the pharmaceutical firm is crucially dependent on the proportion of funds that a pharmaceutical firm invests in the development of professional skills and quality of life of its employees.

Human resources policy in pharmaceutical companies is closely connected with the following functions:

- selection of pharmaceutical personnel;
- alignment and adaptation of pharmaceutical personnel;
- training and certification of pharmaceutical personnel;
- creation of a safe working environment.<sup>9</sup>

Thus, the following essential features of personnel management in modern conditions can be determined:

- assisting the management of the company to achieve its tactical and strategic objectives;
- efficient use of labor potential of each employee;
- providing the organization with qualified and interested employees;
- developing and maintaining the proper level of quality of life of staff;
- interaction of human resources and personnel management with all other parts of the organization;
- ensuring and preserving a favorable moral and psychological climate among employees of the pharmaceutical team.<sup>10</sup>

In a competitive market, the personnel of the pharmaceutical company is the main factor determining its long-term success.

The long-term perspective provides a strategic planning. Planning of pharmaceutical staff requirements is part of the overall planning work on the organization of the field of medicines or in other words, is part of a long-term perspective.

During the organization of work on staff planning, the following objectives are considered:

- how many employees are needed, their qualification, when and where they are required;
- how best to use employees in accordance with their abilities, skills and motivation;
- how to ensure conditions for the development of staff;
- what costs are required for the planned activities.<sup>11</sup>



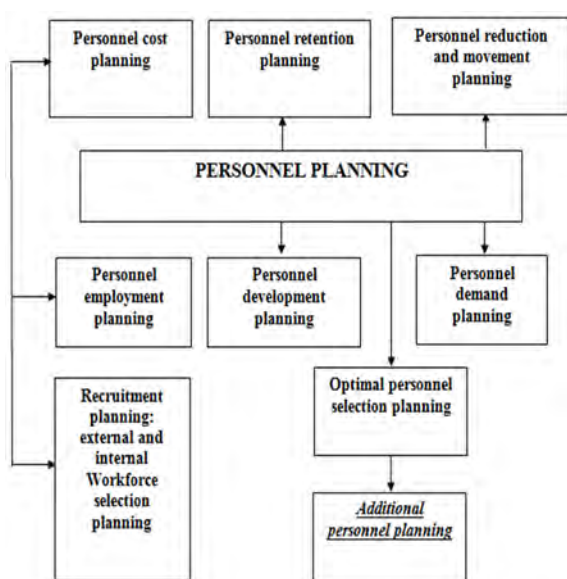
Personnel policy in a market environment has undergone major changes. Therefore, there is a need for broader consideration of motivational processes in personnel management, which causes the refusal to understand work with human resources just as the organizational and methodical work. Currently, the scope of personnel policy covers the main aspects of the development of subjects of the pharmaceutical activity.

This research attempts to address the main objectives of personnel management in the field of pharmaceutical activity – the quantity of employees, their qualification, when and where they are required.

Planning of pharmaceutical staff is a system of complex solutions that allows:

- to provide the organization with the necessary staff;
- to identify pharmacists who are able to solve the assigned tasks and to set new ones;
- to ensure the necessary level of pharmacists' skills;
- to ensure the greatest possible active participation of pharmacists in the organization's activities;
- to provide the organization with additional pharmaceutical personnel during seasonal diseases.

In this connection, the following modified scheme of personnel planning is suggested (Fig. 1).



**Figure 1:** Scheme of personnel planning constituents

The process of planning itself may include different stages, for example:

- identification of issues and objectives of the organization;
- collection of the necessary information;
- search for a solution in the form of measures to achieve the objective;
- implementation of solutions;

- control over the entire process.

There are many types of planning.<sup>12</sup> Among them, the most frequently used are:

- strategic planning which minimizes the weaknesses of the organization through the use of human resources;
- operational planning – planning of current activities.

The purpose of personnel planning is to properly organize a long-term work with the personnel. Demand planning (like any good plan) is based on the prerequisites that allow to make assumptions about the future. The aim of the forecast is to develop these basic prerequisites. When developing plans for personnel demand, one will likely need three types of forecasts:

- for developing requirements for personnel;
- for finding candidates within the organization;
- for finding candidates outside the organization.

It is reasonable to undertake personnel planning based on the results of previous years.<sup>13</sup> At the heart of personnel planning there is a jobs plan. In drawing up such a plan, it is advisable to find out the following peculiarities for each job:

- what knowledge is required by the employee;
- what skill sets are needed for this job;
- what style of behavior is required by the employee.

The initial basis for determining personnel demand is a staff schedule. Experience has shown that the majority of pharmaceutical companies (usually of private ownership) do not make staff schedules, which is a serious drawback in the organization of labor.

In the practical pharmaceutical activity, there is the concept "seasonal overload" associated with the seasonal outbreaks of epidemic diseases in spring and autumn, leading to a great physical and psychological stress of pharmacists and consequently reducing the quality of public services.

For example, in autumn and spring there is an increase in respiratory diseases (URTI, influenza, sore throat, etc.), and in summer – in gastrointestinal diseases (dysentery, colitis, enterocolitis, etc.). During such periods, there is an increase in sales of medicines and medical products, which naturally leads to additional demand for pharmacists, serving the population and responsible for procurement of medicines.

Based on this basis, it is necessary to plan and calculate the additional seasonal demand for personnel in retail pharmaceutical organizations.

## MATERIALS AND METHODS

When calculating personnel demand, different ratios are used, e.g., turnover rate of personnel (F):

$$F = \frac{\text{the number of resignations} + \text{the number of dismissals for violations of labor discipline in the planning period}}{\text{the average number of employees in the planning period}} \times 100\%$$

Absenteeism rate (R):

$$R = \frac{\text{the number of days worked}}{\text{the number of days which should be worked}} \times 100\%$$

There is a current labor requirement, existing at the present moment, and a long-term labor requirement, which will appear after a certain period of time.

The modern methods of determining staff requirements include:

1. Regression analysis, which involves the establishment of a linear relationship between the number of staff and its influencing factors.

The general formula is as follows:<sup>15</sup>

$$T_n = a + b + x;$$

where: **T<sub>n</sub>** – work labor input;

**a** – constant value;

**b** – regression coefficient;

**x** – influencing factor.

2. Correlation analysis, which establishes a close liaison between several parameters.

This may be a dependence that defines a close liaison of one or more parameters with the other parameters, having a significant impact on the number of employees.

3. The expert evaluation method, which uses the experience of professionals and managers and divides into:

- simple evaluation;
- extended evaluation, including both single and multiple expert evaluation.

The extended expert evaluation is conducted by a group of competent employees (experts):

- economic and mathematical methods are based on the development of appropriate economic and mathematical models that are derived from the real mechanism of phenomena and thus provide an adequate reflection of a meaningful process;
- method of comparison is based on the analysis of personnel performance and allows to design staff requirements for the less-developed system in the context of the developed economic system;
- expert method allows to get an idea of demand for specialists by taking into account the views of the group of experts, whose opinions are based on their academic and professional competence. This method is used as part of other methods;

- method of direct calculation involves determining the number of specialists and employees, based on the calculation of labor costs required to implement a periodic function of personnel management to eliminate possible deviations.

Determination of the total and additional demand for specialists is calculated as follows.

Total demand for specialists is a whole number of personnel needed by the organization to carry out the planned activities.

Additional demand is the number of personnel required in the planning period, in addition to the existing number of employees of the reference year, due to the current needs of the organization. Additional demand for personnel is characterized by two indicators: quantitative and qualitative.

Quantitative indicator is the amount of additional staff requirements.

Qualitative indicator characterizes its professional structure, i.e., the structure for the fields of education and specialties.

Total demand for specialists at the end of the year under planning is determined by the formula<sup>6-8</sup>:

$$D_{pl} = N_{pl} \times A_b \quad (1)$$

where, **D<sub>pl</sub>** – the total demand for specialists at the end of the year under planning;

**N<sub>pl</sub>** – the total number of employees at the end of the year under planning;

**A<sub>b</sub>** – the coefficient of specialists' abundance.

The coefficient of specialists' abundance is determined by the ratio of the total demand for specialists (number of positions to be filled by specialists) at the end of the reference year (**D<sub>r</sub>**) to the total number of employees of the reference year (**N<sub>r</sub>**) in percentage terms<sup>16</sup>:

$$A_b = \frac{D_r}{N_r} \times 100\% \quad (2)$$

Additional demand for specialists (**A**) is determined as the sum of the following components:

$$A = A_a + A_i \quad (3)$$

where, **A** is additional demand for the increase in posts to be filled by experts due to the expansion of production;

**A<sub>a</sub>** – additional demand for the compensation of natural attrition.



**A<sub>i</sub>** – additional demand for specialists for the increase in their posts. This indicator is calculated as the difference between their total demand at the end of the planning period (**D<sub>pl</sub>**) and their total demand at the end of the reference year (**D<sub>r</sub>**)<sup>16</sup>:

$$A_i = D_{pl} - D_r \quad (4)$$

For the first year of the planning period, **D<sub>r</sub>** is measured by the number of posts of the staff schedule.

**A<sub>a</sub>** – additional demand for specialists for the compensation of natural attrition is determined by the formula<sup>16</sup>:

$$A_a = \frac{D_r \times C_{a_{avg}}}{100\%} \quad (5)$$

where, **C<sub>a<sub>avg</sub></sub>**

 – the average coefficient of natural attrition.

The annual coefficient of natural attrition is the ratio of the number of leaving specialists due to natural causes during the year, to the value of the total demand for specialists at the end of the respective year in percentage terms.

**C<sub>a<sub>avg</sub></sub>**

 (the average coefficient of natural attrition) is determined as the arithmetic average of the annual coefficients of natural attrition over the past several years (no less than 7)<sup>6-8</sup>:

$$C_{a_{avg}} = \frac{C_{a_1} + C_{a_2} + C_{a_3} + C_{a_4} + C_{a_5} + C_{a_6} + C_{a_7}}{7};$$

where, **C<sub>a<sub>1</sub></sub>**

; **C<sub>a<sub>2</sub></sub>**; ..... ; **C<sub>a<sub>7</sub></sub>** are the annual coefficients of natural attrition over the past 7 years.

## RESULTS AND DISCUSSION

We suggest to introduce a new additional demand **A<sub>s</sub>** to the formula **A = A<sub>a</sub> + A<sub>i</sub>** and call it an additional seasonal demand for specialists-pharmacists.

This additional demand is introduced into the settlement system to determine the number of specialists, taking into account the seasonal factor of pharmacy sales.

**A<sub>s</sub>** (additional seasonal demand for specialists) is determined by examining the different kinds of disease outbreaks over a 10-year period and is taken as a basis for the arithmetic mean.

At first, the value of **I<sub>d</sub>** is determined. **I<sub>d</sub>** is an indicator of a particular disease, showing the ratio of months of an epidemic to one year, i.e. to 12 months.

$$I_d = \frac{n}{12};$$

where, **n** is the number of months during which the disease was reported.

For example, the course of the influenza epidemic was 3 months, then

$$I_d = \frac{3}{12} = \frac{1}{4} = 0.25;$$

**I<sub>d<sub>avg</sub></sub>**

 =  $\frac{I_{d_1} + I_{d_2} + \dots + I_{d_{10}}}{10}$  is the average indicator of a particular disease over the past 10 years.

**I<sub>d</sub>** and **I<sub>d<sub>a</sub></sub>**

 are measured separately for each type of disease (infection outbreaks, epidemics).

As the result, the average arithmetic indicator of the seasonal flow of all types of diseases over the period of 10 years can be determined – **V<sub>d</sub>**

$$V_d = \frac{I_{d_{avg1}} + I_{d_{avg2}} + I_{d_{avg3}} + \dots + I_{d_{avg10}}}{n};$$

where, **n** – the number of average indicators **I<sub>d<sub>avg</sub></sub>**.

Hence:

$$A_s = D_{pl} \times V_d;$$

where, **D<sub>pl</sub>** – the total demand for specialists at the end of the year under planning;

**V<sub>d</sub>** – the average arithmetic indicator of the seasonal flow of all types of diseases over the period of 10 years

Below is the example of the calculation of demand for specialists.

Initial data are:

- The total number of employees at the end of the year under planning (**N<sub>pl</sub>**) – 12.
- The total number of employees at the end of the reference year (**N<sub>r</sub>**) – 10.
- The number of posts to be filled by experts (total demand) at the end of the reference year (**N<sub>r</sub>**) – 3.
- Calculated coefficients of natural attrition over the past 7 years:

$$C_{a_1} - 2.8\%; \quad C_{a_5} - 2.8\%;$$

$$C_{a_2} - 2.9\%; \quad C_{a_6} - 2.7\%;$$

$$C_{a_3} - 2.7\%; \quad C_{a_7} - 2.9\%;$$

$$C_{a_4} - 2.9\%;$$

1) The total demand for specialists measured at the end of the year under planning:

$$A_b = \left(\frac{D_r}{N_r}\right) \times 100\% = \frac{3}{10} \times 100\% = 30\%$$

$$D_{pl} = \frac{N_{pl} \times A_b}{100\%} = \frac{12 \times 30\%}{100\%} = 3.6 \text{ persons} \approx 4 \text{ persons}$$

Additional demand for specialists is calculated as follows:

a) for increase in the number of posts to be filled by experts (**A<sub>i</sub>**):

$$A_i = D_{pl} - D_r = 4 - 3 = 1 \text{ person}$$

b) for the compensation of natural attrition (**A<sub>a</sub>**):

$$C = \frac{C_{a_1} + C_{a_2} + C_{a_3} + C_{a_4} + C_{a_5} + C_{a_6} + C_{a_7}}{7} =$$



$$= \frac{2.9 + 2.9 + 2.7 + 2.9 + 2.8 + 2.7 + 2.9}{7} = 2.8 \%$$

$$A_a = \frac{D_r \times C_a}{100 \%} = \frac{3 \times 2.8}{100 \%} = 0.08$$

c) seasonal demand for specialists ( $A_s$ ):

$$A_s = D_{pl} \times V_d = 4 \times V_d$$

Then we consider two seasons, autumn and spring, when the respiratory diseases are active (in our case the influenza), over the last 10 years.

The duration of the influenza in autumn is 3 months, and in spring – 2 months (the last 10-th year), i.e. we find the arithmetic mean of the duration of influenza over the last year:

$$\frac{3 + 2}{2} = \frac{5}{2} = 2.5 \text{ months}$$

$$Id_{10} = \frac{2.5}{12} = 0.21$$

$$Id_1 = 0.25$$

$$Id_2 = 0.17$$

$$Id_3 = 0.21$$

$$Id_4 = 0.29$$

$$Id_5 = 0.25$$

$$Id_6 = 0.21$$

$$Id_7 = 0.29$$

$$Id_8 = 0.25$$

$$Id_9 = 0.17$$

$$Id_{10} = 0.21$$

$$V_{d_{avg}} = \frac{Id_{avg1} + Id_{avg2} + Id_{avg3} + \dots + Id_{avg10}}{10} = \frac{2.3}{10} = 0.23 ;$$

$$A_s = 4 \times 0.23 = 0.92 \approx 1.$$

Therefore, the additional demand for specialists is calculated by adding 3 indicators:

$$A = A_i + A_a + A_s$$

$$A = 1 + 0.08 + 1$$

$$A = 2.08 \approx 2 \text{ persons}$$

The structure of the additional demand according to specialties and the level of education (higher education or vocational) is determined by more detailed calculations.

## CONCLUSION

Due to the results of the research, there have been elaborated methodological recommendations on "Planning the additional seasonal demand for pharmaceutical personnel". They are implemented in practical pharmaceutical organizations through the Association for Support and Development of the Pharmaceutical Activity of the South Kazakhstan region of the Republic of Kazakhstan and the Department of the

Committee of Medical and Pharmaceutical Activity Control of the South Kazakhstan region of the Republic of Kazakhstan.

Thus, planning of the additional seasonal demand for pharmaceutical staff improves the quality and level of patient care of pharmaceutical companies, thereby increasing sales volume and competitiveness of a pharmaceutical company in the market.

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