Analysis of the domestic market of compressor and ultrasonic nebulizers

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

The aim of the work is to organize informational files about compressors and ultrasonic nebulizers determination of actuality and availability in marketing analysis of the domestic market.

Materials and methods. Data from the Apteka.UA and the official website of Tabletki.ua were used to analyze the brand and assortment structure of ultrasonic and compressor nebulizers. The search analytical, systematic, comparative, and statistical methods and methods of mathematical and logical analysis were used in the work.

Results. The analysis of the market of assortment and brand structures of the compressor and ultrasonic nebulizers was carried out. The obtained results showed the presence on the market of 16 manufacturers from 10 countries in the world of compressor nebulizers and 9 manufacturers from 7 countries in the world of ultrasonic nebulizers. Among them, the largest suppliers were identified, such as Omron Healthcare (Japan) and LLC Medhouse Swiss GmbH (Ukraine). The calculated stress coefficient indicated greater competition between compressor manufacturers (Ksi = 0.94) compared to ultrasonic (Ksi = 0.88) nebulizers. The level of monopolization was determined using the Herfindahl–Hirschman index. The results indicated a moderately concentrated market for both types of nebulizers. Analysis of socio-economic affordability by indicators of price liquidity ratio and solvency adequacy noted low availability of this group of goods for consumers of pharmacies.

Conclusions. The results of the company structure research indicated the vast majority of manufacturers of foreign companies and a wide range of both ultrasonic and compressor nebulizers. In the course of the work, the available commodity positions in pharmacies in Ukraine were investigated. According to the calculations of the coefficient of tension and the level of monopolization. It was possible to determine the competitiveness among manufacturing firms. The results of the assessment of the liquidity ratio and the adequacy of solvency made it possible to assess the purchasing power of the population in this group of goods.

Key words: pharmaceutical preparations, marketing, ultrasonic nebulizers, compressor nebulizers, analysis, pricing.

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Аналіз вітчизняного ринку компрессорних та ультразвукових небулайзерів

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Мета роботи – формування інформаційного масиву про компрессорні й ультразвукові небулайзери, визначення актуальності їхньої доступності на підставі маркетингового аналізу вітчизняного ринку.

Матеріали та методи. Для здійснення аналізу фірмової та асортиментної структури компрессорних та ультразвукових небулайзерів використали дані «Щотижневика АПТЕКА» та офіційного сайту Tabletki.ua. Застосовували системно-аналітичний, математико-статистичний і порівняльний методи аналізу.

Результати. Здійснили аналіз ринку асортиментної та фірмової структур компрессорних та ультразвукових небулайзерів. У результаті встановлено наявність на ринку 16 фірм-виробників компрессорних небулайзерів із 10 країн світу, а також 9 фірм-виробників ультразвукових небулайзерів із 7 країн світу. Визначили найбільших постачальників: Omron Healthcare (Японія) і ТОВ «Медхаус Свіс ГМБХ» (Україна).

Розрахований коефіцієнт напруженості вказав на більшу конкуренцію між виробниками компрессорних небулайзерів (Kvi = 0,94) порівняно з ультразвуковими (Kvi = 0,88). Рівень монополізації встановили, використавши індекс Херфіндаля–Хіршмана. Результати свідчать про помірно-концентрований ринок для обох типів небулайзерів. Аналіз соціально-економічної доступності за показниками коефіцієнта ліквідності цін та адекватності платоспроможності показали низьку доступність цієї групи товарів для споживачів аптечних закладів.

Key words: pharmaceutical preparations, marketing, ultrasonic nebulizers, compressor nebulizers, analysis, pricing.

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A nebulizer is an aerosol-generating device that contains fine particles. Today nebulizer therapy is based on modern technology, which is successfully used around the world and increases the effectiveness of treatment of many diseases [1–3]. Nebulizer therapy is gaining increasing recognition among both physicians and patients. Nebulizer inhalation is one of the most reliable, simple, and effective treatments. Previously, this therapy was possible only in the hospital. Now the nebulizer can be purchased at any pharmacy. The nebulizer is needed by a family where children often suffer from SARS, bronchitis, especially with bronchoobstructive syndrome, as well as children with chronic respiratory diseases (bronchial asthma, cystic fibrosis).

There are several types of nebulizers. Compressor and ultrasonic are considered to be the most common in Ukraine. Although ultrasonic nebulizers are more compact and silent, a number of drugs (hormones, antibiotics, etc.) are destroyed by the ultrasound, which reduces the effectiveness of treatment. Another disadvantage of these inhalers is their high cost.

Compressor nebulizers, in turn, are recognized as the “gold standard” of inhalation treatment due to their reliability, ease of disinfection, and the breadth of drugs used. They are designed for any inhalation solutions, do not affect hormonal drugs and medications that are afraid of high temperatures. Apparently, the only drawback of the compressor nebulizer is the noisy operation. Although in modern devices, such as Japanese nebulizers the noise level is only 45 dB, which allows you to do inhalation even during sleep [4,5].

All standard inhalation solutions manufactured by pharmaceutical companies in a ready-to-use form can be used in compressor nebulizers. However, the use of ultrasonic nebulizers is gaining pace today.

**Aim**

The aim of the work is to organize informational files about compressors and ultrasonic nebulizers determination of actuality and availability in marketing analysis of the domestic market.

**Materials and methods**

Data from the Apteka.UA and the official website of Tabletki.ua were used to analyze the brand and assortment structure of compressor nebulizers.

The search analytical, systematic, comparative, and statistical methods and methods of mathematical and logical analysis were used in the work [6,7].

**Results**

The first stage of the work was to study the geography of manufacturers of ultrasonic and compressor nebulizers supplied to pharmacies in Ukraine. It was established that the retail market of compressor nebulizers was represented by 16 companies from 10 countries (Table 1).

The market for ultrasonic nebulizers was characterized by a small number of companies, namely 9 companies from 7 countries (Table 2). The analysis of the number of nebulizers supplied to the pharmaceutical market of Ukraine showed that the number of product items, both compressor, and ultrasonic nebulizers, was formed at the expense of Ukrainian manufacturers.

Market conditions require maintaining a high level of competitiveness—one of the main components of the company’s success in domestic and international markets.

To determine the level of competition between manufacturers of compressor and ultrasonic nebulizers calculated the stress factor $K_{vi}$ according to the formula

$$Kvi = \frac{n - 1}{n}$$

(1),

where $n$ – number of all competing counterparts of firms [8,9].

The results of the obtained indicator of competitiveness of compressor ($Kvi = 0.94$) and ultrasonic nebulizers ($Kvi = 0.88$) indicated significant competition between manufacturers of this category of goods.

Among the indicators that characterize the level of market monopolization the most widespread was the Herfindahl–Hirschman Index ($HHI$), which was defined as the sum of squares of shares of all enterprises operating in the market:

$$HHI = \sum_{i=1}^{n} S_i^2$$

(2)

Our calculations showed that the Herfindahl–Hirschman index among the manufacturers of compressor nebulizers on the Ukrainian market was $HHI = 1048.80$. Analysis of the level of monopolization among the manufacturers of ultrasonic nebulizers presented on the Ukrainian market it was $HHI = 1481.19$.

Since the calculated values are within $1000 < HHI \leq 1800$, the level of monopolization among the manufacturers of both types of nebulizers was moderately concentrated [10].

Next, the share of the regional pharmaceutical market segment occupied by each of the manufacturers of compressor and ultrasonic nebulizers was calculated.

The calculation was performed according to the formula:
Table 1. Data on pharmaceutical companies that provide compressor nebulizers to the pharmaceutical market of Ukraine

| #   | Manufacturer                              | Country      | Number of product items | Ratio to total, % | Market segment share (dij) |
|-----|-------------------------------------------|--------------|-------------------------|------------------|---------------------------|
| 1.  | LLC Medhouse Swiss GmbH                    | Ukraine      | 13                      | 20.00            | 0.5000                    |
| 2.  | LLC Dopomoga-I                             |              | 1                       | 1.54             | 0.0153                    |
| 3.  | LLC Yuri-Pharm                             |              | 3                       | 4.62             | 0.0462                    |
| 4.  | LLC Dolphi-Ukraine                         |              | 1                       | 1.54             | 0.0153                    |
| 5.  | Dongguan Aidisy Machinery & Electronic Equipment Co. Ltd | China | 6                       | 9.23             | 0.0923                    |
| 6.  | MEDHIT                                     |              | 1                       | 1.54             | 0.0153                    |
| 7.  | Heaco Medical Technology                   | Great Britain| 1                       | 1.54             | 0.0153                    |
| 8.  | Longevity                                  |              | 3                       | 4.62             | 0.0462                    |
| 9.  | Microlife                                  | Switzerland  | 2                       | 3.08             | 0.0307                    |
| 10. | B.Well Swiss AG                            |              | 4                       | 6.16             | 0.0615                    |
| 11. | Beurer GmbH                                | Germany      | 3                       | 4.62             | 0.0462                    |
| 12. | A&D Company Limited                        | India        | 3                       | 4.62             | 0.0462                    |
| 13. | Rossmax International Ltd                  | Taiwan       | 5                       | 7.70             | 0.0769                    |
| 14. | Little Doctor International Pte. Ltd       | Singapore    | 7                       | 10.77            | 0.1076                    |
| 15. | Norditalia Group S.r.l.                    | Italy        | 2                       | 3.08             | 0.0307                    |
| 16. | Omron Healthcare                           | Japan        | 10                      | 15.38            | 0.1538                    |
|     |                                           |              |                         |                  |                           |
| 65  |                                           |              |                         |                  | 65                        |
| 100 |                                           |              |                         |                  | 100                       |

Table 2. Data on pharmaceutical companies that provide ultrasonic nebulizers to the pharmaceutical market of Ukraine

| #   | Manufacturer                          | Country     | Number of product items | Ratio to total, % | Market segment share (dij) |
|-----|---------------------------------------|-------------|-------------------------|------------------|---------------------------|
| 1.  | LLC Medhouse Swiss GmbH                | Ukraine     | 2                       | 22.22            | 0.250                     |
| 2.  | VAPO Healthcare Co. Ltd                | China       | 1                       | 11.11            | 0.125                     |
| 3.  | Heaco Medical Technology               | Great Britain| 1                       | 11.11            | 0.125                     |
| 4.  | Beurer GmbH                           | Germany     | 1                       | 11.11            | 0.125                     |
| 5.  | Little Doctor International Pte. Ltd   | Singapore   | 1                       | 11.11            | 0.125                     |
| 7.  | Omron Healthcare                      | Japan       | 1                       | 11.11            | 0.250                     |
| 8.  | A&D Company Limited                    | India       | 1                       | 11.11            | 0.125                     |
| 9.  | Oromed                                | Poland      | 1                       | 11.11            | 0.125                     |
|     |                                       |             |                         |                  | 9                         |
| 100 |                                       |             |                         |                  | 100                       |

Table 3. Results of analysis of indicators of socio-economic availability of compressor nebulizers of a retail pharmacy chain Ukrainian

| #   | The name of the medical device        | Manufacturer                                  | Retail price, max, UAH | Retail price, min, UAH | K1q  | Average retail price, UAH | Ca.s. |
|-----|--------------------------------------|----------------------------------------------|------------------------|------------------------|------|---------------------------|-------|
| 1.  | Gamma Effect Max                     | LLC Medhouse Swiss GmbH                        | 1364.00                | 782.90                 | 0.74 | 1073.45                   | 0.074 |
| 2.  | Gamma Effect New                     |                                              | 1987.65                | 896.00                 | 1.21 | 1443.83                   | 0.099 |
| 3.  | Gamma Nemo                            |                                              | 1610.70                | 1185.30                | 0.36 | 1398.00                   | 0.096 |
| 4.  | Dr. Frei turbo mini                   |                                              | 3085.00                | 1105.90                | 1.79 | 3314.95                   | 0.227 |
| 5.  | Dr. Frei turbo train                  |                                              | 2126.30                | 1652.90                | 0.23 | 1889.60                   | 0.129 |
| 6.  | Dr. Frei turbo Car                    |                                              | 2994.20                | 1150.00                | 1.60 | 2072.10                   | 0.142 |
| 7.  | Dr. Frei turbo base                   |                                              | 1836.70                | 878.00                 | 1.09 | 1357.35                   | 0.093 |
| 8.  | Dr. Frei turbo pro                    |                                              | 2945.30                | 1449.90                | 1.03 | 2197.60                   | 0.151 |

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| #   | The name of the medical device                          | Manufacturer                          | Retail price, max, UAH | Retail price, min, UAH | Kliq | Average retail price, UAH | Ca.s. |
|-----|---------------------------------------------------------|---------------------------------------|------------------------|------------------------|------|--------------------------|-------|
| 9.  | Dr. Frei turbo flow                                     | LLC Medhouse Swiss GmbH               | -                      | -                      | -    | -                        | -     |
| 10. | ProMedica Briz                                          | LLC Medhouse Swiss GmbH               | 2328.55                | 907.79                 | 1.57 | 1618.17                  | 0.111 |
| 11. | Vega VN-420 Aero                                        | LLC Medhouse Swiss GmbH               | 1752.70                | 909.90                 | 0.93 | 1331.30                  | 0.091 |
| 12. | Vega Family CN-01W                                      | LLC Medhouse Swiss GmbH               | 1462.10                | 1005.90                | 0.45 | 1234.00                  | 0.085 |
| 13. | Vega CN-02 WX Samy                                      | LLC Medhouse Swiss GmbH               | 1615.30                | 849.00                 | 0.90 | 1232.15                  | 0.085 |
| 14. | Vega VN-420 Aero                                        | LLC Medhouse Swiss GmbH               | 1752.70                | 909.90                 | 0.93 | 1331.30                  | 0.091 |
| 15. | Ulaizer Home CN-02MY                                    | LLC Yuri-Pharm                        | 1858.00                | 629.16                 | 1.95 | 1243.58                  | 0.085 |
| 16. | Ulaizer Air+                                            | LLC Medhouse Swiss GmbH               | 2351.00                | 973.70                 | 1.41 | 1662.35                  | 0.114 |
| 17. | Ulaizer first aid CN-02MQ                               | LLC Medhouse Swiss GmbH               | 1354.45                | 600.99                 | 1.25 | 977.72                   | 0.067 |
| 18. | Medicare                                                | LLC Medhouse Swiss GmbH               | 947.16                 | 929.92                 | 0.02 | 938.54                   | 0.064 |
| 19. | Microlife NEB 200                                       | Microlife                             | 2005.00                | 1123.00                | 0.79 | 1564.00                  | 0.107 |
| 20. | Microlife NEB 400                                       | Microlife                             | 1626.10                | 1289.90                | 0.26 | 1457.50                  | 0.099 |
| 21. | B.Well PRO-115                                          | B.Well Swiss AG                       | 1722.00                | 1106.00                | 0.56 | 1414.00                  | 0.097 |
| 22. | B.Well PRO-110                                          | B.Well Swiss AG                       | 1368.00                | 999.00                 | 0.37 | 1183.50                  | 0.081 |
| 23. | B.Well MED-121                                          | B.Well Swiss AG                       | 1499.00                | -                      | 0    | 1499.00                  | 0.103 |
| 24. | B.Well MED-120                                          | B.Well Swiss AG                       | 1699.80                | 1616.90                | 0.05 | 1659.35                  | 0.114 |
| 25. | AND CN-233                                              | A&D Company Limited                   | 2071.00                | 1250.50                | 0.66 | 1660.76                  | 0.114 |
| 26. | AND CN-234                                              | A&D Company Limited                   | 2554.00                | 1762.00                | 0.45 | 2158.00                  | 0.148 |
| 27. | AND CN-231                                              | A&D Company Limited                   | 2438.00                | 2098.00                | 0.16 | 2268.00                  | 0.156 |
| 28. | Beurer IH 21                                            | Beurer GmbH                           | 1799.00                | 1503.85                | 0.20 | 1615.43                  | 0.113 |
| 29. | Beurer IH 26                                            | Beurer GmbH                           | 2680.00                | 1799.00                | 0.49 | 2239.50                  | 0.154 |
| 30. | Beurer IH 58                                            | Beurer GmbH                           | 2580.00                | 2298.00                | 0.12 | 2439.00                  | 0.167 |
| 31. | Heaco WNE211                                             | Heaco Medical Technology               | 993.40                 | 899.00                 | 0.11 | 946.20                   | 0.065 |
| 32. | Little Doctor LD-221C                                   | Little Doctor International Pte. Ltd  | 1365.00                | 850.00                 | 0.61 | 1107.50                  | 0.076 |
| 33. | Little Doctor LD-212C                                   | Little Doctor International Pte. Ltd  | 1739.60                | 1225.13                | 0.35 | 1482.37                  | 0.102 |
| 34. | Little Doctor LD-211C                                   | Little Doctor International Pte. Ltd  | 1980.80                | 1290.00                | 0.54 | 1635.40                  | 0.112 |
| 35. | Little Doctor LD-212C                                   | Little Doctor International Pte. Ltd  | 1158.95                | 1112.00                | 0.04 | 1135.48                  | 0.078 |
| 36. | Little Doctor LD-211C                                   | Little Doctor International Pte. Ltd  | 1980.80                | 1322.00                | 0.50 | 1651.40                  | 0.113 |
| 37. | Little Doctor LD-210C                                   | Little Doctor International Pte. Ltd  | 2394.90                | 1819.00                | 0.32 | 2106.95                  | 0.145 |
| 38. | Little Doctor LD-220C                                   | Little Doctor International Pte. Ltd  | 1031.00                | -                      | 0    | 1031.00                  | 0.071 |
| 39. | Longevita CNB69012 Blue                                 | Longevita                             | 1202.00                | 597.20                 | 1.01 | 899.60                   | 0.062 |
| 40. | Longevita Classic CNB69008                              | Longevita                             | 1119.80                | 788.80                 | 0.42 | 954.30                   | 0.065 |
| 41. | Longevita CNB69012 Pink                                 | Longevita                             | 1201.40                | 900.00                 | 0.33 | 1050.70                  | 0.072 |
| 42. | MEDHIT Master                                           | MEDHIT                                | 1471.00                | 786.90                 | 0.87 | 1128.95                  | 0.078 |
| 43. | Nord Italia Arianne Power                              | Norditalia Group S.r.l                | 1600.30                | 779.60                 | 1.05 | 1189.95                  | 0.082 |
| 44. | NordItalia Drop                                         | Norditalia Group S.r.l                | 1401.90                | 716.10                 | 0.95 | 1059.00                  | 0.073 |
| 45. | Omron C101 ESSENTIAL (NE-C101-E)                        | Omron Healthcare                      | 1306.50                | 1000.00                | 0.31 | 1153.25                  | 0.079 |
| 46. | Omron C102 Total (NE-C102-E) 2-in-1                     | Omron Healthcare                      | 2520.70                | 1854.90                | 0.36 | 2187.80                  | 0.150 |
| 47. | Omron NE-C803                                           | Omron Healthcare                      | 1834.30                | 1314.00                | 0.40 | 1574.15                  | 0.108 |
| 48. | Omron NE-C801                                           | Omron Healthcare                      | 2783.30                | 750.00                 | 2.71 | 1766.65                  | 0.121 |
| 49. | Omron CompAir NE-C24 Kids                               | Omron Healthcare                      | 2990.00                | 797.00                 | 2.75 | 1893.50                  | 0.129 |
| 50. | Omron NE-C28P                                           | Omron Healthcare                      | 3568.75                | 1397.40                | 1.55 | 2483.08                  | 0.170 |
\[ d_{ij} = \frac{n_{ij}}{\sum n_{ij}} \] (3),

where \( n_{ij} \) – the number of nebulizers of the \( j \)-th company in the \( i \)-segment;
\( \sum n_{ij} \) – total number of nebulizers of the \( i \)-th segment registered in Ukraine;
\( S_i \) – market share of the company;
\( n \) – the number of all companies;
\( i = 1 \ldots n \); \( n \) is the number of market participants [8,9].

According to the results which was shown in Table 1. It was seen that the largest share in the segment of compressor nebulizers falls on LLC Medhouse Swiss GmbH (\( d_{ij} = 0.5000 \))

In second place was Omron Healthcare (\( d_{ij} = 0.1538 \)).
Third place went to Little Doctor International Pte. Ltd (\( d_{ij} = 0.1076 \)).
Among the manufacturers of ultrasonic nebulizers (Table 2). LLC Medhouse Swiss GmbH (\( d_{ij} = 0.250 \)) and Omron Healthcare (\( d_{ij} = 0.250 \)) had the largest share.

Subsequently, some socio-economic indicators that characterize the availability of medical devices for consumers were studied. Thus, for the analysis of the price situation and to determine the availability of nebulizers of both types, the liquidity ratio (\( K_{liq} \)) and the solvency ratio of the population (\( C_{a.s} \)) were calculated.

The liquidity ratio \( K_{liq} \) was shown the ratio between the maximum and minimum price of a particular product in a given period of time in a particular pharmaceutical market, calculated by the formula: The liquidity ratio was calculated by the formula:

| # | The name of the medical device | Manufacturer | Retail price, max, UAH | Retail price, min, UAH | \( K_{liq} \) | Average retail price, UAH | Ca.s. |
|---|-------------------------------|--------------|------------------------|------------------------|----------|---------------------------|------|
| 51. | Omron A3 Complete NE-C300-E | Omron Healthcare | 3459.35 | 2183.40 | 0.58 | 2821.38 | 0.194 |
| 52. | Omron DuoBaby NE-C301-E | | 2425.85 | 2105.00 | 0.15 | 2265.43 | 0.155 |
| 53. | Omron Nami Cat | | 2268.50 | 1820.40 | 0.23 | 2044.45 | 0.140 |
| 54. | Omron CompAir Eco Kids NE-C302-E | | - | - | - | - | - |
| 55. | Paramed Compact Plus | Dongguan Aidisy Machinery & Electronic Equipment Co. Ltd. | 1216.60 | 542.49 | 1.24 | 879.55 | 0.060 |
| 56. | Paramed Air Plus | | 1465.04 | 830.00 | 0.77 | 1147.52 | 0.079 |
| 57. | Paramed Assistant | | 1436.80 | 781.70 | 0.84 | 1109.25 | 0.076 |
| 58. | Paramed Puppy | | 2016.00 | 861.90 | 1.34 | 1438.95 | 0.099 |
| 59. | Paramed Compact | | 1043.00 | 650.00 | 0.60 | 846.50 | 0.058 |
| 60. | Paramed Air Pro | | 1440.00 | 981.00 | 0.47 | 1210.50 | 0.083 |
| 61. | Rosmax NE100 | Rosmax International Ltd. | 1698.40 | 1020.00 | 0.67 | 1359.20 | 0.093 |
| 62. | Rosmax NA100 | | 2152.20 | 1172.91 | 0.83 | 1662.56 | 0.114 |
| 63. | Rosmax NB500 | | 2544.40 | 1827.00 | 0.39 | 2185.70 | 0.150 |
| 64. | Rosmax NF60 Dog Kids | | 2435.80 | 1327.48 | 0.83 | 1881.64 | 0.129 |
| 65. | Rosmax NB100 | | 1317.75 | - | - | 1317.75 | 0.090 |

Table 4. The results of the analysis of socio-economic indicators of ultrasonic nebulizers of retail pharmacy networks of Ukraine
The obtained results showed that compressor nebulizers had a liquidity ratio > 0.15, which confirmed a fairly large range between their minimum and maximum price. However, the exceptions were the following items: B. Well MED-120 (Switzerland), Beurer IH 58 (Germany), Little Doctor LD-212C (Singapore), Medicare (Ukraine) and Omron DuoBaby NE-C301-E (Japan) (Table 3). Among the ultrasonic nebulizers available to consumers in retail pharmacy chains $K_{liq} > 0.15$ (Table 4). This indicates a lack of influence of regulators on the pricing of medical devices and was unethical for patients in terms of social responsibility of pharmaceutical market players.

The coefficient of adequacy of the solvency of the population characterizes the dynamics of the ratio between the price of goods and the solvency of the population. calculated by the formula:

$$K_{a.s.} = \frac{P}{W_a.w.} \times 100 \%$$  \hspace{1cm} (5),

where $K_{a.s.}$ – solvency adequacy ratio; $P$ – the average price of the drug for a certain period of time (February 2022); $W_a.w.$ – average salary for a certain period (according to the State Statistics Service of Ukraine).

As of January 2022 the average salary was UAH 14577 [11]. It was believed that the lower the value of the coefficient of availability, the more accessible to the population was the product. The results showed that the values of the solvency adequacy ratio for compressor nebulizers range from 0.058 (Paramed Compact, China) to 0.194 (Omron A3 Complete NE-C300-E, Japan) (Table 3). For ultrasonic nebulizers, the calculated figure showed low affordability for consumers and was in the range of 0.11 to 0.25 (Table 4).

Discussion

The results of the company structure research indicated the vast majority of manufacturers of foreign companies and a wide range of both ultrasonic and compressor nebulizers. In the course of the work, the available commodity positions in pharmacies in Ukraine were investigated. According to the calculations of the coefficient of tension and the level of monopolization. It was possible to determine the competitiveness among manufacturing firms. The results of the assessment of the liquidity ratio and the adequacy of solvency made it possible to assess the purchasing power of the population in this group of goods.

**Conclusions**

1. The brand and assortment structure of compressor and ultrasonic nebulizers, the vast majority of which were of foreign origin were analyzed.

2. It was established that the largest supplier of compressor and ultrasonic nebulizers to the Ukrainian market was LLC Medhouse Swiss GmbH (Ukraine).

3. The calculated market monopolization index showed that the market of compressor ($HII = 1048.80$) and ultrasonic nebulizers ($HII = 1481.19$) was moderately concentrated.

4. The determined level of competition of compressor nebulizers ($K_{vi} = 0.94$) was higher in comparison with ultrasonic nebulizers ($K_{vi} = 0.88$) which indicates greater competition between manufacturers of compressor nebulizers.

5. The analysis of determining the socio-economic accessibility of nebulizers by liquidity ratio ($K_{liq}$) and solvency adequacy ratio ($K_{a.s.}$), was showed low availability of this group of goods for consumers of pharmacy chains.

**Conflicts of interest:** authors have no conflict of interest to declare.

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