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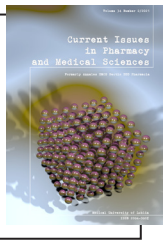

The COVID-19 – related problems encountered by nursing homes in Poland and the steps undertaken to prevent disease spread in the first phase of the epidemic

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ABSTRACT

Nursing Homes (NHs) are institutions of social assistance run by local governments or non-government organizations. Their purpose is to provide individuals with basic services. On March 20, 2020, the Regulation of the Minister of Health issued the declaration of the COVID-19 epidemic in Poland. The introduction of legal regulations allowed the authorities to take actions to prevent infections at NHs. The aim of the study was to analyze the COVID-19 – related problems encountered by nursing homes in Poland and the steps undertaken to prevent disease spread in the first phase of the epidemic.

The survey was conducted with use of an original questionnaire e-mailed to 532 NHs throughout Poland in May 2020. Results were analysed by way of the IBM SPSS Statistics program.

A total of 89 completed questionnaires were received from: 40 NHs organized by local government (44.9%), 24 run by churches (27.0%), 13 established by non-governmental organizations (14.6%) and 12 operating privately (13.5%). Among them, 78 NHs had less than 100 employees (87.6%) and 11 had more than 100 employees (12.4%), while 68 had up to 100 inhabitants (76.4%) and 21 had more than 100 inhabitants (23.6%). All NHs had problems with recruiting and retaining enough nursing staff.

The most commonly used method of COVID-19 spread prevention at NHs in the first phase of the pandemic was establishing an increased sanitary regime, monitoring of temperature of residents and staff members and preparing isolation rooms. The greatest problem was personnel shortages.

INTRODUCTION

In the Polish legal system, Nursing Homes (NHs) are institutions of social assistance, the purpose of which is to provide individuals and families with basic services in a situation where they cannot obtain them on their own within the available distribution channels [1]. One of the forms of social assistance is the stay in the NH, which usually occurs after the environmental services previously provided to a given person are exhausted or ineffective. The NHs are intended to replace the home environment in which the person had lived within. Hence, it is also a substitute for family and social life – both indispensable spheres of human functioning [1].

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The NHs are permanent residence facilities for people requiring round-the-clock care due to age, illness or disability, who are unable to function independently in everyday life and cannot be provided with the necessary assistance in the form of home care services. The NHs operate on the basis of uniform operating standards adopted for all facilities in the country, regardless of the entity running them. Ownership of NHs is primarily focused on differences between for-profit, non-profit and government-operated NHs [2].

In an American study from 2019, it was noticed that increased Medicare census was associated with improved performance in the proportion of residents with pressure ulcers. However, better funding from Medicare was associated with greater patient intake and significant decline in performance among non-profit, but not for-profit, facilities

[3]. In the case of Polish NHs, there are different types of institutions organized separately for: elderly, chronically ill, mentally ill, physically disabled, addicted to alcohol and for intellectually disabled adults. Polish NHs may be run by local government units, churches, religious associations, non-government organizations (NGOs) or individual persons. According to the data of the Central Statistical Office, in 2017, the average life expectancy for men was 74.0 years and for women 81.8 years [4]. Therefore, every year a growing number of elderly seek good care. This situation has forced the legislator to include more and more organizations that are not public finance units in the social welfare system, hence, the wide range of entities running the institutions and the progressive liquidation of the state monopoly for the provision of social assistance services [5].

To run a NH in a form regulated by law, a permit is required by the competent voivode. There are also institutions resembling NHs in Poland, which do not have the relevant permits and are not NHs in the legal sense, which means that they are not subject to state control in this regard [6]. The NH provides living, care, support and educational services in forms that meet the individual needs of the residents. These services consist, in particular, in providing a place of residence, food, maintenance of cleanliness, care, assistance in dealing with basic personal and life matters, maintaining contact with the family, participation in occupational therapy or religious practices, and satisfying cultural needs [7]. The general standards of NHs' functioning are defined by relevant regulations, individual institutions operate on the basis of statutes and regulations issued by the founding bodies [8]. According to The Central Statistical Office, there were 876 NHs of all types in Poland in 2018 [9].

The NHs as social welfare institutions are, in many cases, not assessed as the optimal form of the provision of social welfare services, as the need to provide adequate healthcare services is emphasized as a form that is more beneficial for the given person and also more beneficial from the point of view of a broader social policy [1]. At the same time, in the perspective of recent years, economic difficulties related to running NHs have been described, in particular, the growing costs of institution functioning in the face of the limited financial possibilities of the local governments responsible for them. As a result, the income obtained by NHs does not cover the costs of their activities, and the system of the NH network itself is increasingly burdening the budgets of local governments [5].

In the light of Polish law, we can talk about the COVID-19 epidemic as officially beginning in March 20, 2020, when the Regulation of the Minister of Health was issued on the declaration of an epidemic in the territory of the Republic of Poland. The provision came into force on the day of its announcement [10]. However, the formal announcement of the epidemic was preceded by the adoption on March 2, 2020 of the Act on special solutions related to the prevention, counteracting and combating COVID-19, other infectious diseases and the crisis situations caused by them [11]. On the example of the NHs operating in the city of Lublin, it can be stated that the first preventive measures were introduced before the enactment of the above-mentioned regulations, at the end of February 2020, on the basis of the decisions of the directors of individual institutions, and they included, above all, restrictions in the contacts of the NHs residents with people from outside the NHs.

The introduction of legal regulations allowed the state and local government authorities to take actions based on legal provisions to prevent and combat threats caused by COVID-19. In the first phase of the epidemic, these activities took the form of orders, guidelines and instructions addressed to the entities conducting the NHs. On March 12, 2020, i.e. even before the state of the epidemic was announced, the Lublin Voivode (representative of the government in the region) issued a written order for immediate execution on the need to limit the activity of the residents of Social Care Centers outside the premises of the facilities, which in fact was an order to prohibit the residents from leaving them. This order legalized the restrictions introduced by the decisions of the directors of institutions, lasting from the end of February [12]. The order was detailed by the instruction issued by the Lublin Voivodship Office on March 17, 2020, covering the rules of conduct for NHs managers and employees [13].

The actions of the Lublin Voivode took place even before the state of the epidemic was announced. Following the instructions of the Lublin Voivode, on March 26, 2020, the Minister of Family, Labor and Social Policy issued recommendations confirming, inter alia, the need to isolate NHs institutional residents. The issue of isolation of residents in institutions requires special emphasis because it is an extraordinary measure, one that significantly limits the rights of the residents of the Social Care Center, and at the same time one that is very painful – as those inside were deprived of the possibility of leaving the Social Care Center or receiving visits from their families and relatives [14].

AIM

The aim of the study was to analyze the COVID-19 – related problems encountered by NHs in Poland and the preventive measures undertaken to counter disease spread in the first phase of the epidemic.

MATERIALS AND METHODS

The study was conducted using the proprietary online questionnaire sent to all institutions acting in Poland under the NH formula that were run by local governments, individuals and enterprises, churches and religious unions and NGOs on May 14-27 2020. In total, the questionnaire was delivered to 532 NHs (270 – self-governmental; 102 – private; 111 – organized by church; 49 – run by NGOs). The address data of the institutions were obtained from registers kept by voivodeship offices, industry portals and websites of entities running NHs. The survey questionnaire consisted of 21 questions.

Due to the type of obtained data, as well as in order to ensure the respondents' complete security in a situation where the data provided could cast them in an unfavorable light or give rise to accusations, the participants of the study – directors or managers of institutions – were informed about

the anonymity and voluntary participation in study. A total of 89 correctly completed questionnaires were collected and included in the analysis. The analysis of statistical data was performed with the use of the IBM SPSS Statistics statistical program.

RESULTS

A total of 89 completed questionnaires were received from: 40 NHs organized by local government (44.9%), 24 by churches (27.0%), 13 by non-governmental organizations (14.6%) and 12 private (13.5%). Among them, 78 NHs had less than 100 employees (87.6%) and 11 had more than 100 employees (12.4%) (Tab. 1), while 68 had up to 100 inhabitants (76.4%) and 21 had more than 100 inhabitants (23.6%). All NHs had problems with recruiting and keeping nursing staff (Tab. 2).

Table 1. Number of employees in the examined NHs

		NHs organized by self-government N=40	Private NHs N=12	NHs organized by church N=24	NHs organized by non-government organizations N=13	All participating NHs N=89
The number of NH employees	<100	82.5%	83.3%	95.8%	92.3%	87.6%
	>100	17.5%	16.7%	4.2%	7.7%	12.4%
Total		100.0%	100.0%	100.0%	100.0%	100%

Table 2. The number of NH inhabitants

		NHs organized by self-government N=40	Private NHs N=12	NHs organized by church N=24	NHs organized by non-government organizations N=13	All participating NHs N=89
Number of NH inhabitants	<100	64.1%	100.0%	79.2%	84.6%	76.4%
	>100	35.9%		20.8%	15.4%	23.6%
Total		100.0%	100.0%	100.0%	100.0%	100%

In order to characterize security measures implemented in NHs during the COVID-19 pandemic, the respondents were asked: 'What security measures did the NH introduce during the COVID-19 pandemic?' It outlined 11 possible precautionary measures from which respondents could select those they had introduced. Table 3 presents the empirical data for all respondents broken down by type of NHs (Tab. 3).

Table 3. Security measures implemented in NHs during COVID-19 pandemic

	Total	
	%	N
Restriction/prohibition of visiting residents of the nh	98.9	88
Restriction/ban on leaving the NH by residents	96.6	86
Implementation of an increased sanitary regimen	94.4	84
Daily body temperature measurement in employees	94.4	84
Body temperature measurements in residents twice daily	83.1	74
Preparation of isolation rooms	74.2	66
Restriction/ban on accepting parcels for NH residents	47.2	42
Preparation of rooms for employees' accommodation	41.6	37
Introduction of daily measurement of respiratory rate in residents	39.3	35
Introducing rotational work of care teams, e.g. 7 or 14 days	12.4	11
Other	1.2	1

The most frequently introduced security measure, which was introduced by almost all centers, was a ban on visiting NH residents (98.9%), then a ban on leaving the NH by residents (96.6%), as well as implementing an increased sanitary regime (94.4%) and introducing body temperature measurement in patients (94.4%). The remaining solutions consisted mainly in the preparation of the logistics base, which consisted in the preparation of isolation rooms (74.2%) or preparation of accommodation facilities for employees (41.6%). The least frequently used solution was the introduction of rotational work of care teams (12.4%). Other security means were employed in 1.2% NHs.

In order to search for hidden dimensions and structures in the relationships between the above-mentioned variables, factor analysis of the principal components method was used. This method can also be applied to resolve problems incorporating dichotomous variables, provided that each variable contains information about a different trait. Principal component analysis using dichotomous variables usually produces useful results [15]. In this case, the variables are coded in a dichotomous manner, where "1" means that a specific security measure has been implemented in a given NH, and "0" means that this security measure has not been implemented in a given NH. This will allow 10 safety measures to be transformed into a space with a reduced dimension using the principal components method [16].

It was assumed that certain factors, i.e. the implemented security measures, are perceived jointly by the respondents, despite the fact that they describe diverse methods of protection against COVID-19. Factor analysis will reduce the number of 10 indicators to the optimal number of hidden variables that sufficiently explain the relationship between many observable variables. As a result of calculating for eleven indicators, an average degree of matching of the data set to the assumptions of factor analysis was obtained, measured by the statistics that for the entire data set, reached the value of 0.657, which, according to the interpretation, can be described as average and indicates an average, but acceptable adequacy of the data set to assumptions of factor analysis [15]. Chi^2 statistics assumed the value of 264.958, and the corresponding significance, with the number of degrees of freedom of 55, was at the level of 0.000, which allows us to conclude that the correlation matrix is significantly different from the unit matrix (Tab. 4) [16].

Table 4. Kaiser-Mayer-Olkina and Bartlett's test

Measure of the adequacy of the sample selection		0.657
Bartlett sphericity test	Approximate chi-square	264.958
	df	55
	Relevance	0.000

The decision to choose the optimal number of factors was made on the basis of the Kaiser criterion, which indicates that the first nine factors with eigenvalues above 1 should be used for further analysis (Tab. 5) [16]. These factors explain

a total of 64.156% of the variance of all twenty-eight variables. The scree diagram was also used to select the optimal number of factors.

Table. 5. Total variance explained

Component	Initial eigenvalues			Sums of squared charges after rotation		
	Total	% variance	% cumulative	Total	% variance	% cumulative
1	3.164	28.766	28.766	2.316	21.057	21.057
2	1.484	13.495	42.261	1.952	17.744	38.801
3	1.300	11.814	54.075	1.658	15.072	53.873
4	1.109	10.081	64.156	1.131	10.283	64.156

Method of extracting factors – main components

Based on the factor analysis of eleven indicators defining the main security methods, four main components were distinguished. These can be interpreted as four models of security introduced within the NHs (Tab. 6). The first model (F1), explaining 21.06%, was defined as a sanitary regime, strongly related to such indicators as: restriction / prohibition of leaving the NHs by residents, restriction/ban on visiting residents, implementation of an increased sanitary regime. The second group (F2), explaining 17.75% of the variance, are patient and staff monitoring activities that are strongly associated with the introduction of two daily body temperature measurements for residents and employees, as well as the introduction of daily respiratory rate measurements for residents. The third model (F3) explains 15.01% of the variance and represents a group of activities focused on logistics and housing solutions, strongly related to such indicators as introducing rotational work of care teams, preparing rooms for accommodation for employees and preparing rooms for isolation. The fourth group (F4) explaining 10.29% of the variance, consisting of only two indicators (other and not limiting the receipt of packages in NHs), is a group of other solutions.

Table 6. Matrix of rotated components

	Component			
	F1	F2	F3	F4
Restriction/ban on leaving NHs by residents	0.862	0.298	0.064	-0.066
Restriction/prohibition of visiting residents of the NH	0.824	-0.272	0.084	0.049
Implementation of an increased sanitary regime	0.769	0.415	0.096	-0.064
Introducing body temperature measurements in residents twice daily	-0.014	0.845	0.085	0.056
Daily body temperature measurement in employees	0.290	0.819	0.086	-0.113
Introduction of daily measurement of respiratory rate in residents	0.096	0.412	0.357	0.400
Introducing rotational work of care teams, e.g. 7 or 14 days	-0.047	-0.023	0.807	0.035
Preparation of rooms for employees' accommodation	0.066	0.144	0.732	-0.231
Preparation of isoation rooms	0.361	0.146	0.546	0.159
Other	0.074	0.062	-0.098	0.865
Restriction/ban on accepting parcels for NH residents	0.258	0.131	-0.008	-0.342

Method of extracting factors – main components
Rotation method – Varimax with Kaiser normalization
a. Rotation converged in 5 iterations

Answers to the other questions were summarized in Table 7. NGOs had the greatest problems with maintaining staff numbers during the first phase of COVID-19 pandemic. All types of NHs reported large number of employees on sick leave. However, all types of settings managed to have enough staff for day and night shifts. All types of NHs in particular complained about having nursing staff shortages. Almost all the NHs received support in the form of personal protective equipment (PPE) i.e. gowns, gloves, respirators, face shields. The guidelines, recommendations and instructions from the Ministry of Health were considered moderately useful. Instructions from voivodeship (self-government units) was found useful in the majority of cases.

The majority of NHs did not test their residents for COVID-19. However, 41-70% of all employees had a test for COVID-19, but respondents complained that it was hard to obtain the tests. In up to 25% of all NHs, COVID-19 was confirmed among residents, and in 2.6 to 9.1% – among employees. This resulted in the fact that 26 to 46% of all NHs were quarantined. The vast majority of infected residents were evacuated to the nearest infectious disease hospitals. A majority of NHs representatives responded that their institutions were unable to combat the threats of pandemic.

DISCUSSION

The number of people admitted to NHs is steadily increasing. Good care, access to occupational and physical therapy and healthy nutritional regimes, together with contact with other inhabitants, families and medical specialists have helped to improve their physical health status and decrease depression [17]. During the COVID-19 pandemic, many volvoids hit by the disease suffered from nursing staff shortages and allowed out-of-state nurses and recently graduated nursing students to practice in order to meet the needs for medical professional care [18]. In our study, we also recorded that the greatest problems during the first phase of COVID-19 pandemic in Poland that NHs had, was finding enough nurses to work. In general, there is not enough nurses in the country. Local government (Voivod) could have issued a compulsary work order for nurses if there was an urgent need for nursing personnel in a local NH. Moreover, local authorities could have prohibited simultaneous employment in two health-care facilities. That was because of the evidence that among all medical professionals, nurses were in close contact with patients most often and had the highest risk of catching patient-sourced infection.

There is evidence that lockdown significantly increased the level of stress in the nursing staff [19]. In our study we found that many nurses and other NH employees went on sick leave in the first phase of COVID-19 pandemic. However, Polish Social Security controlled those who were on sick leave and if it was considered unjustified, the person had to go back to work. Still, being forced to stay home and to endure lockdown had a negative impact on the psyche of people. In a Polish study comprised of 471 participants, it was found that people living alone during the COVID-19 pandemic had higher levels of depression, insomnia, loneliness and fatigue [20].

Representatives of NHs responding to our questionnaire complained about being poorly equipped for the COVID-19 pandemic. Material support, mainly personal protective equipment (PPE) and instructions from the Ministry of Health and local government were considered the most useful for NHs in Poland. In other countries, the

Table 7. Answers to questions 7-24 in the questionnaire

	NHs founded by local governments	Private NHs	NHs organized by church	NHs organised by NGOs
Were there any staffing problems in the NH during the pandemic?	Yes 56.4% No 43.6%	Yes 45.5% No 54.5%	Yes 50% No 50%	Yes 61.5% No 38.5%
What were the reasons for the staffing problems?	Sick leave 74.1%	Sick leave 50%	Sick leave 80%	Sick leave 75%
Have staffing problems prevented the full staffing of changes in employees?	Yes 37.1% No 62.9%	Yes 20% No 80%	Yes 26.3% No 73.7%	Yes 0% No 100%
In which professional group did the staffing problems occur?	Nurses 64.5%	Nurses 60.1%	Nurses 55.6%	Nurses 54.5%
In which professional group did the MOST SERIOUS staff problems occur?	Nurses 51.7%	Nurses 22.2%	Nurses 40%	Nurses 62.5%
Has the NH received additional support during the pandemic?	PPE 100%	PPE 41.7%	PPE 95.8%	PPE 92.3%
Has the NH received guidelines, recommendations and instructions for the pandemic?	From Ministry of Health 95%	From Ministry of Health 83.3%	From Ministry of Health 100%	From Ministry of Health 92.3%
Were the documents useful?	Useless 27.5% Of little use 0% Moderately 50% Highly 22.5%	Useless 9.1% Of little use 45.5% Moderately 18.2% Highly 27.3%	Useless 0% Of little use 12.5% Moderately 45.8% Highly 41.7%	Useless 0% Of little use 23.1% Moderately 30.8% Highly 46.2%
Which of the bodies issued the MOST USEFUL guidelines, recommendations, instructions?	Ministry of Health and voivodeship 41%	Ministry of Health and voivodeship 50%	Ministry of Health and voivodeship 73.9%	Ministry of Health and voivodeship 45.5%
Were the guidelines,recommendations, instructions feasible?	Entirely 0% Mostly 45% Moderately 52.5% Were impossible to implement 2.5%	Entirely 8.3% Mostly 50% Moderately 33.3% Were impossible to implement 8.4%	Entirely 4.1% Mostly 66.7% Moderately 29.2% Were impossible to implement 0%	Entirely 23.1% Mostly 46.2% Moderately 30.8% Were impossible to implement 0%
Has the NH been tested for the presence of SARS CoV-2 among the residents?	Yes 7.5% No 92.5%	Yes 9.1% No 90.9%	Yes 8.3% No 91.7%	Yes 23.1% No 76.0%
Has the NH conducted tests for the presence of SARS CoV-2 among employees?	Yes 70% No 30%	Yes 45.5% No 54.5%	Yes 41.7% No 58.3%	Yes 69.2% No 30.8%
Was it possible for the NH to obtain a SARS-CoV-2 screening tests for employees and residents?	Impossible 17.1% Hard 60% Easy 22.9%	Impossible 18.2% Hard 36.6% Easy 45.5%	Impossible 0% Hard 57.9% Easy 42.1%	Impossible 0% Hard 66.7% Easy 33.3%
Were there cases of SARS CoV-2 among the residents in the NH?	Yes 0% No 100%	Yes 25% No 75%	Yes % No 100%	Yes 7.7% No 92.3%
Were cases of SARS CoV-2 reported among employees of the NH?	Yes 2.6% No 97.4%	Yes 9.1% No 90.9%	Yes 3.3% No 95.7%	Yes 7.7% No 92.3%
Was the NH quarantined in relation to suspected persons or persons confirmed to be infected with SARS CoV-2?	Yes 39.5% No 60.5%	Yes 36.4% No 63.6%	Yes 26.1% No 73.9%	Yes 46.2% No 53.8%
In case of suspicion or confirmation that a resident suffered from SARS CoV-2, what steps were undertaken?	Resident stayed in quarantine in the NH 5.3% The resident was immediately evacuated to an infectious disease hospital 94.7%	Resident stayed in quarantine in the NH 25% The resident was immediately evacuated to an infectious disease hospital 75%	Resident stayed in quarantine in the NH 27.3% The resident was immediately evacuated to an infectious disease hospital 72.7%	Resident stayed in quarantine in the NH 25% The resident was immediately evacuated to an infectious disease hospital 75%
Is the NH, as a social assistance institution in the current legal, financial and organizational formula, able to effectively combat the threats of a pandemic on its own (without external support)?	to the full extent 0% to a significant extent 10% in a moderate range 32.5% it is unable to combat the threats of a pandemic 57.5%	to the full extent 0% to a significant extent 33.3% in a moderate range 41.7% it is unable to combat the threats of a pandemic 25%	to the full extent 0% to a significant extent 4.2% in a moderate range 50% it is unable to combat the threats of a pandemic 45.8%	to the full extent 0% to a significant extent 7.7% in a moderate range 46.2% it is unable to combat the threats of a pandemic 46.2%

information, instructions and guidelines provided by the Ministries of Health were also considered the most useful, reliable and possible to implement [21]. The majority of participants of our study assessed NHs as unable to combat the threats of a pandemic on their own (without external support). No COVID-19 cases were recorded in the first phase of pandemic in the inhabitants of NHs organized by local governments and churches. The highest percentage of infected residents (25%) was in private settings. In the U.S., independent non-profit nursing homes had the highest overall rating score of care quality, followed by facilities in small non-profit chains, and independent for-profit facilities [22].

CONCLUSION

The most commonly used method of COVID-19 spread prevention at NHs in the first phase of the pandemic was increased sanitary regime, temperature measurement of residents and staff members, and preparation of isolation rooms. The greatest problem was with personnel shortages.

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