



Evaluation of Patient-Oriented Medicines Supply Information on Russian Healthcare Providers' Websites

Nikita V. Polukhin^{1*}, Natalia V. Ekkert¹ and Mikhail V. Vodolagin¹

¹*N.A. Semashko Department of Public Health and Health Care, Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University), Moscow, Russian Federation.*

Authors' contributions

This work was carried out in collaboration among all authors. Author NVP designed the study, performed the statistical analysis, wrote the protocol, managed the literature searches, and wrote the first draft of the manuscript. Authors NVP and MVV performed the data collection. Authors NVE and MVV performed the editing. Author NVE provided the general supervision and managed the analyses of study. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To evaluate the Russian Federation healthcare providers' websites compliance to legal requirements on availability of patient-oriented medicines supply information and compare the evaluation results between public and private healthcare facilities.

Study Design: Cross-sectional study.

Place and Duration of Study: The evaluation of compliance to legal requirements to medicines supply information on public and private healthcare providers' websites available on the Internet was conducted in September 2021.

Methodology: The study included a simple random sample of 66 websites of Russian healthcare providers containing two groups: public (n=33) and private (n=33) healthcare facilities' websites. The compliance evaluation was performed by checking the availability of 4 medicines lists on the

websites: (1) essential medicines list; (2) list of medicines for the most expensive chronic diseases to treat; (3) list of medicines that are prescribed only by shared decision of healthcare facility medical commission; (4) list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings.

Results: The difference of availability of the first list was 90.9% (95% CI 77.7%–97.4%) vs. 33.3% (95% CI 19.2%–50.3%) on public and private healthcare facilities' website, respectively, $P < .001$. The difference of that in the second list was 42.4% (95% CI 26.8%–59.3%) vs. 15.2% (95% CI 6.0%–30.1%), $P < .028$. For the third no statistical significance was revealed ($P > .05$). For the fourth list the difference was 66.7% (95% CI 49.7%–80.8%) vs. 21.2% (95% CI 10.0%–37.2%), $P < .001$.

Conclusion: It is required to improve the supervision approaches for both public and private healthcare facilities for better patient-oriented medicines supply information provision. The problem may be solved by the implementation of a centralized government policy repository with regularly updated lists, requirements, and best practices.

Keywords: Website; provider; health facility; communication; essential medicines; patient empowerment.

1. INTRODUCTION

The medicines supply is considered as an important component of healthcare both on global and regional levels [1,2]. The main concern is the availability of life-saving and essential medications. The availability of orphan medicines to treat rare diseases is also of primary importance [3,4]. The World Health Organization (WHO) sees access to affordable, high-quality essential medicines as critically important to equity in public health [5]. The first Essential Medicines List (EML) was published by WHO in 1977. The current version (22nd EML) was published in September 2021. Moreover, since 2007, WHO has been publishing and updating the Essential Medicines List for Children (EMLc). WHO EMLs are the basis for the development and improvement of regional and national policy approaches to the medicines supply. Many countries, including the Russian Federation, publish their own lists of essential medicines in accordance or at least somewhat similar with current versions of WHO EMLs [6].

Nonetheless, the availability and affordability of medicines are not the only factors that determine their accessibility and health outcomes. The patients' awareness about public medicines supply and health literacy are also considered as key aspects in public health [7,8]. In particular, low health literacy and a lack of information about social and financial support for medicines dispensation are associated with low medication adherence resulting from its high cost, especially for the lower socioeconomic groups [9–12] and those with chronic diseases that are rare or require lifetime medication, for example patients with diabetes mellitus [13,14]. The Order of the

Ministry of Health of Russian Federation no. 66, dated 13 February 2013, states the public provision of the full and comprehensible information as one of the main priorities of the strategy for medicines supply until 2025 [15].

Informing patients about individualized medicines is largely the responsibility of health professionals [7,16] and is mostly considered in in-personal visit settings [17,18]. It has been reported that the provision of information regarding the disease and the medication helps the patient to control their behavior and has a positive impact on the treatment outcomes [19]. However, as the digital society evolves, patient-provider communication via the internet becomes one of the leading channels, especially in outpatient care [20,21]. According to recent studies, more than 70% of patients in the European region use the internet for health information-seeking purposes [22,23]. The survey conducted in Russian Federation presented that 43% of patients in Russia use the internet to find information about medicines and order them online. 23% of Russian patients develop, change, and update their medication based on the information about diseases and medicines found on the internet [24]. The patients' main motivation to use the internet for health information is its convenience while healthcare benefits from better treatment adherence, outcomes, and patient satisfaction with healthcare services [25,26].

Despite the wide range of available online information sources, doctors and pharmacists are recognized as the most credible references of information about health and medicines for the majority of patients [27]. However, patients tend

to search the information on the internet when their doctor does not satisfy their informational need [28]. In this regard, healthcare facilities' websites combine both credibility and convenience by providing curated information on health and medicines available in comfortable settings.

The patient-oriented medicines supply information provision is obligatory for all healthcare facilities' websites in Russian Federation. It is regulated by the Order of the Ministry of Health of Russian Federation no. 956n, dated 30 December 2014 [29]. Up to now, far too little attention has been paid to the legal requirements compliance evaluations of Russian healthcare providers' websites medicines supply information provision. Whilst some research has been carried out on general compliance, only one study has attempted to investigate the patient medicines supply information provision but on a local level [30]. This indicates a need to explore the problem on the federal level. This study, therefore, set out to evaluate the Russian Federation healthcare providers' websites compliance to federal legal requirements on availability of patient-oriented medicines supply information and compare the evaluation results between public and private healthcare facilities.

2. MATERIAL AND METHODS

The cross-sectional evaluation was conducted in September 2021. The list of Russian healthcare facilities' websites was obtained from the registry of open access healthcare regulatory and reference information repositories of the Ministry of Health of the Russian Federation (repository no. 1.2.643.5.1.13.13.11.1461 titled "Register of Medical Organizations of the Russian Federation") [31]. The list then was divided into two groups: public and private healthcare facilities. The healthcare policy in the Russian Federation only allows health professionals who are employed by healthcare facilities to provide healthcare services, and thus healthcare providers in this study are viewed only as entities, not individuals.

The sample size was calculated according to the formula for comparing proportions provided by H. Wang and S-C. Chow [32]. Based on a previously conducted study, the rounded proportions of medicines supply information requirement compliant healthcare facilities' websites were 0.95 and 0.70 for public and private healthcare facilities, respectively [30]. The

power of 80% and confidence level of 95% were respectively used to determine the number of units of observation per group (n=33). To control for bias both sample groups were selected independently based on the random number generator and the matching row number in the repository database. Healthcare providers' website URLs were determined based on web-based search, using keywords combined from the healthcare facility name and address extracted from the respective database cells. Initially, the exclusion criterion for the healthcare facility was non-availability of its website, but none were deemed ineligible because all the websites for randomly picked providers were available for the evaluation.

The research method was derived from previously conducted studies on healthcare providers' website quality evaluation based on legal requirement compliance assessment [30]. For the purpose of analysis 4 compliance criteria were extracted from the Order of the Ministry of Health of Russian Federation no. 956n. Paragraphs 8–11 of its Annex no. 2 state the obligatory requirements to publish 4 lists of medicines on the healthcare provider's website: (1) essential medicines list; (2) list of medicines for the most expensive chronic diseases to treat; (3) list of medicines that are prescribed only by shared decision of healthcare facility medical commission (a group of doctors, at least three must be involved); (4) list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings. Thus individual compliance to the availability of each list was measured as a nominal binary variable (compliant or not compliant). The overall compliance was determined if all legal requirements were met on the evaluated website (binary). The compliance rate was estimated as proportion: a sum of compliant criteria from 0 to 4 divided by 4 and multiplied by 100% (continuous variable).

The evaluation was performed by two researchers independently to reduce bias. Mismatches in evaluation results were then discussed and marked as compliant or not compliant according to the argued agreement between evaluators. The informed consent collection was not applicable for the current study because units of observations were publically accessible websites, not humans or animals. However, according to ethics concerns, authors did not disclose the data that may be used to identify websites analyzed in the present study

and by that use that information for any non-academic purposes.

Proportions for each compliance criterion were subjected to two-sided Fischer’s exact test for difference significance assessment. Cramér’s V was estimated to measure the strength of association between nominal variables. The strength of association was considered weak for $V < .1$, moderate for $.1 \leq V \leq .3$, and strong for $V > .3$. Categorical variables were presented as proportion. The estimation of 95% confidence interval was performed for the generalization of sample proportions to the population level. The Kolmogorov-Smirnov (K-S) test was used to assess the normality of compliance rates (numerical variable) in both groups. K-S test result significance of $P < .05$ for both groups indicated that those do not follow the normal distribution. Thus the compliance rate comparison between the two groups was

assessed by the Mann-Whitney U-test and reported as median and values of the first and the third quartiles. Differences were considered significant for $P < .05$.

Data management and analysis were performed using IBM SPSS Statistics 26.0

3. RESULTS

Healthcare providers’ websites were evaluated for legal requirement on medicines supply information provision compliance. Table 1 presents an overview of distribution of compliant criteria within two groups (public healthcare providers’ websites and private healthcare providers’ websites).

As shown in Table 1, the largest proportion of compliance among all healthcare providers’ websites was found in essential medicines list of

Table 1. The distribution of healthcare providers’ (HPs) websites (n=66) compliance to federal legal requirements on availability of patient-oriented medicines supply information along with Fischer’s exact test and Cramér’s V results

Criterion*	All HPs (n=66)		Public HPs (n=33)		Private HPs (n=33)		P	V
	n	n, % (95% CI)	n	n, % (95% CI)	n	n, % (95% CI)		
EML	41	62.1 (50.1–73.1)	30	90.9 (77.7–97.4)	11	33.3 (19.2–50.3)	<.001	.593
LMED	19	28.8 (18.9–40.4)	14	42.4 (26.8–59.3)	5	15.2 (6.0–30.1)	.028	.301
LMC	15	22.7 (13.9–33.9)	10	30.3 (16.8–47.1)	5	15.2 (6.0–30.1)	.142	.181
LFD	29	43.9 (32.4–56.0)	22	66.7 (49.7–80.8)	7	21.2 (10.0–37.2)	<.001	.458

*EML — essential medicines list of Russian Federation, LMED — list of medicines for the most expensive chronic diseases to treat, LMC — list of medicines that are prescribed only by shared decision of healthcare facility medical commission, LFD — list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings

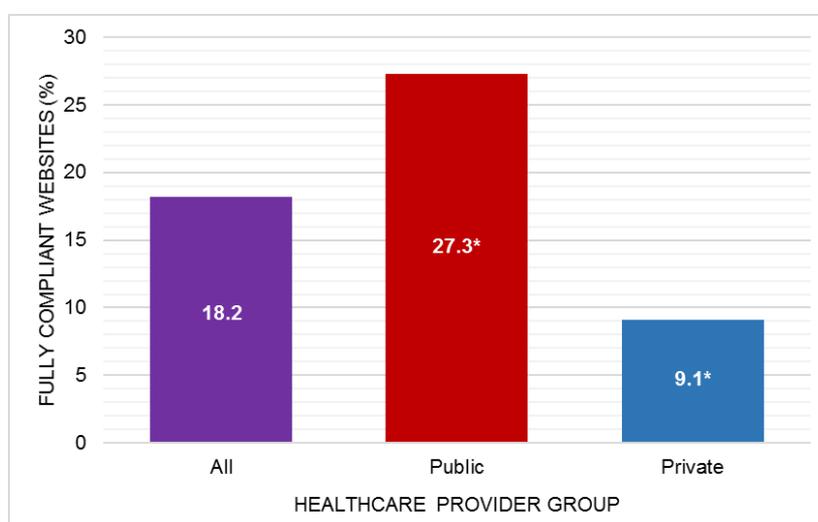


Fig. 1. The distribution of healthcare providers’ (HPs) websites (n=66) compliance to federal legal requirements on availability of patient-oriented medicines supply (per 100 websites)

* $P > 0.05$

Russian Federation availability (62.1%). The compliance of both public and private healthcare providers' websites was the highest for this criterion: 90.9% (95% CI 77.7%–97.4%) and 33.3% (95% CI 19.2%–50.3%) for public and private healthcare providers, respectively. There was a significant difference in proportions between these two groups ($P < .001$). The strength of association according to Cramér's V was strong (.593).

The second most compliant criterion was the availability of the list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings. The overall compliance was 43.9% (95% CI 32.4%–56.0%), while proportions observed in groups were 66.7%(95% CI 49.7%–80.8%) in public and 21.2%(95% CI 10.0%–37.2%) in private healthcare providers. There was a significant difference in compliance between the two groups ($P < .001$) with a strong association between nominal variables (.458).

It was identified that only one-third (28.8%; 95% CI 18.9%–40.4%) of Russian healthcare providers' websites are compliant with the requirement to availability of the list of medicines for the most expensive chronic diseases to treat. The proportion of compliance in public healthcare facilities' websites was 42.4% (95% CI 26.8%–59.3%), while in private healthcare providers it was only 15.2% (6.0%–30.1%). Those proportions differed significantly ($P = .028$) with barely strong

associations identified from Cramér's V (.301).

The least compliant criterion was the availability of the list of medicines that are prescribed only by shared decision of healthcare facility medical commission. Less than one-fifth (22.7%; 95 CI 13.9%–33.9%) of Russian healthcare providers' websites were compliant to this criterion. The proportion of compliant websites of public healthcare facilities was the lowest among all criteria (30.3%; 95% CI 16.8%–47.1%). The proportion of private healthcare facilities was the same as in the list of medicines for the most expensive chronic diseases to treat availability (15.2%; 95% CI 6.0%–30.1%). Despite observed differences in proportion between groups in sample, there were no statistically significant difference identified on population level ($P > .05$). It was also supported by weak association revealed by Cramér's V (.181).

The overall compliance of all healthcare facilities' websites and that of groups are presented in Fig. 1. As shown in Fig. 1, the compliance of all healthcare providers' websites was 18.2% (95% CI 10.3%–28.8%). The largest overall compliance was observed in a sample group of public healthcare providers' websites (27.3%; 95% CI 14.4%–43.9%). Sample private healthcare providers' overall compliance was observed three times less frequently than in public healthcare providers (9.1%; 95% CI 2.6%–22.3%). Notwithstanding the observed difference between groups, difference on population level was found to be not statistically significant ($P > .05$).

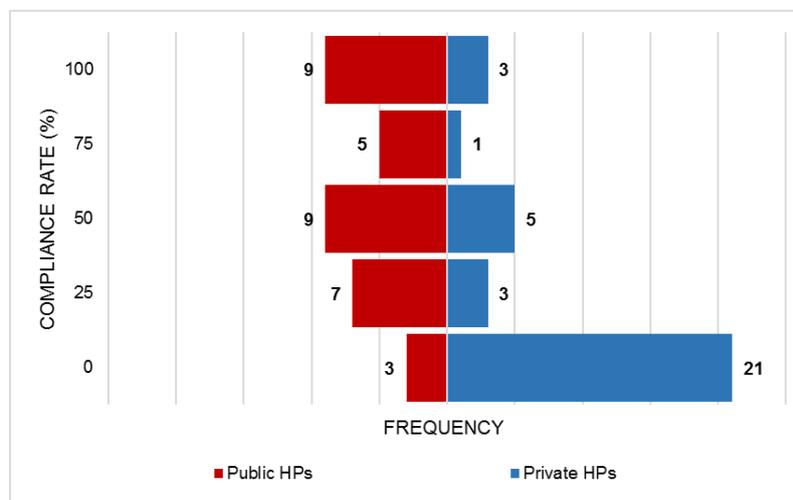


Fig. 2. The two-sided histogram of compliance rates among public (n=33) and private (n=33) healthcare providers' (HPs) websites (per 100 websites)

The compliance rate distribution is presented in Fig. 2. There was a significant difference in the compliance rates between public (25%; Q_1-Q_3 : 0%–100%) and private (0%; Q_1-Q_3 : 0%–50%) healthcare websites, $U(n_{\text{public}}=33, n_{\text{private}}=33)=230.50$, $Z=-4.170$, $P < .001$. The most frequent values of compliance rate of public healthcare providers' websites were 50% and 100% ($n=9$). The less frequent value of compliance rate in this group was 0% ($n=3$). The right half of the graph shows that the most frequent compliance rate value for private healthcare facilities was 0% ($n=21$).

4. DISCUSSION

The current study was the first one on patient-oriented medicines supply information in Russian healthcare providers' websites. The study revealed that only 18.2% of healthcare facilities are fully compliant to the legal requirements on public medicine supply information provision.

As mentioned in the literature review, patient-oriented medicines supply information provision is important for supporting treatment adherence, achievement of better outcomes, and improvements of the patient satisfaction with healthcare services [25,26], especially for patients with rare and chronic diseases that require lifetime medication [13,14] and those in lower socioeconomic groups [9–12]. Those patients must be provided with comprehensive information about available social and financial support as such patients are particularly vulnerable to unaffordable medicines and various social and health risks.

The largest proportion of compliant websites was observed in the essential medicines list availability criterion in both groups of healthcare providers. It may indicate the better awareness of healthcare facilities authorities and health professionals about essential medicines list both published by WHO and Russian Federation government agencies. However, the proportion was far from 100%, so it is important to improve awareness of health professionals about essential medicines list importance for public health. The presence of low health professionals awareness was reported in one of the previously conducted studies [33]. On the other hand, the availability of essential medicines list on healthcare provider's websites may also result from greater patient awareness. The broad mass media coverage of the topics related to essential

medicines supply and updates in respective lists contribute to the knowledge dissemination even among those groups that are not actively seeking for health-related information. There is evidence that mass media can significantly influence health behaviors, such as how patients use medicines [34].

The similar distribution was observed in evaluation of availability of the list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings. Better treatment adherence and outcomes are particularly apparent when social and financial support is available for patients [19,25,26]. The list of medicines that are dispensed for certain social groups with no charge or with 50% discount in outpatient care settings contains medicines and groups that are in the most need of social support: senior retired citizens, people with disabilities, patients with rare and chronic diseases, especially those that are expensive to treat and require lifetime medication like diabetes mellitus. For such patients, better adherence is essential for prolonging their lives, improving their quality of life, and avoiding co-morbidities [35].

One unanticipated finding was that only two of the evaluated healthcare providers' websites had up-to-date versions of all the required lists. Even though it is not required by the legal acts, it is important to publish updated versions of lists because those are updated regularly and may contain crucial innovations or exemptions, influencing the medicine supply to certain groups or the whole population. Current versions of at least part of lists were observed only on public healthcare facilities' websites, indicating that those are updated more regularly.

Lower proportions of compliance were revealed in the availability of a list of medicines for the most expensive chronic diseases to treat and the list of medicines that are prescribed only by shared decision of the healthcare facility medical commission. The results indicate that health professionals, as well as patients, are less aware of these two lists. Perhaps the cause is that there are fewer illnesses that require higher expenditures, and they are observed as less common. As for the list of medicines that are prescribed only by shared decision of healthcare facility medical commission, the creation of such commission requires additional organizational actions. The scope of the medical commission can vary considerably based on

internal processes in healthcare facilities, despite the fact that it is required to operate in all facilities.

The results of this study show that despite statistically significant differences in individual criteria of compliance to legal requirements, the overall compliance did not differ significantly. Nonetheless, a significant difference was revealed between compliance rate that was higher in public healthcare facilities. These findings may indicate the better awareness of public healthcare facilities authorities about current legal requirements in healthcare in the Russian Federation. A possible explanation for these results could be the stronger centralized management of the public healthcare sector along with more active supervision of the activities of the public healthcare facilities by supervisory authorities. However, according to the study results, patients' informational needs on medicines supply are not fully met by both public and private healthcare facilities.

5. CONCLUSIONS

The lack of availability of patient-oriented medicines supply information on healthcare providers' websites may potentially lower the patients' adherence, outcomes, and satisfaction. Public healthcare providers' websites provide more comprehensive patient-oriented medicines supply information than those of private healthcare providers. However, it is required to improve the supervision approaches for both public and private healthcare facilities. Even though private healthcare facilities' usually do not provide medicines for free, the information on medicines supply is crucial to patients to fulfill their informational needs. The problem of inadequate medicines supply information provision may be solved by the implementation of a centralized government policy repository with regularly updated lists, requirements, and best practices.

CONSENT

Not applicable.

ETHICAL APPROVAL

The study did not involve humans or animals thus ethical approval was not required by authors' institution.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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