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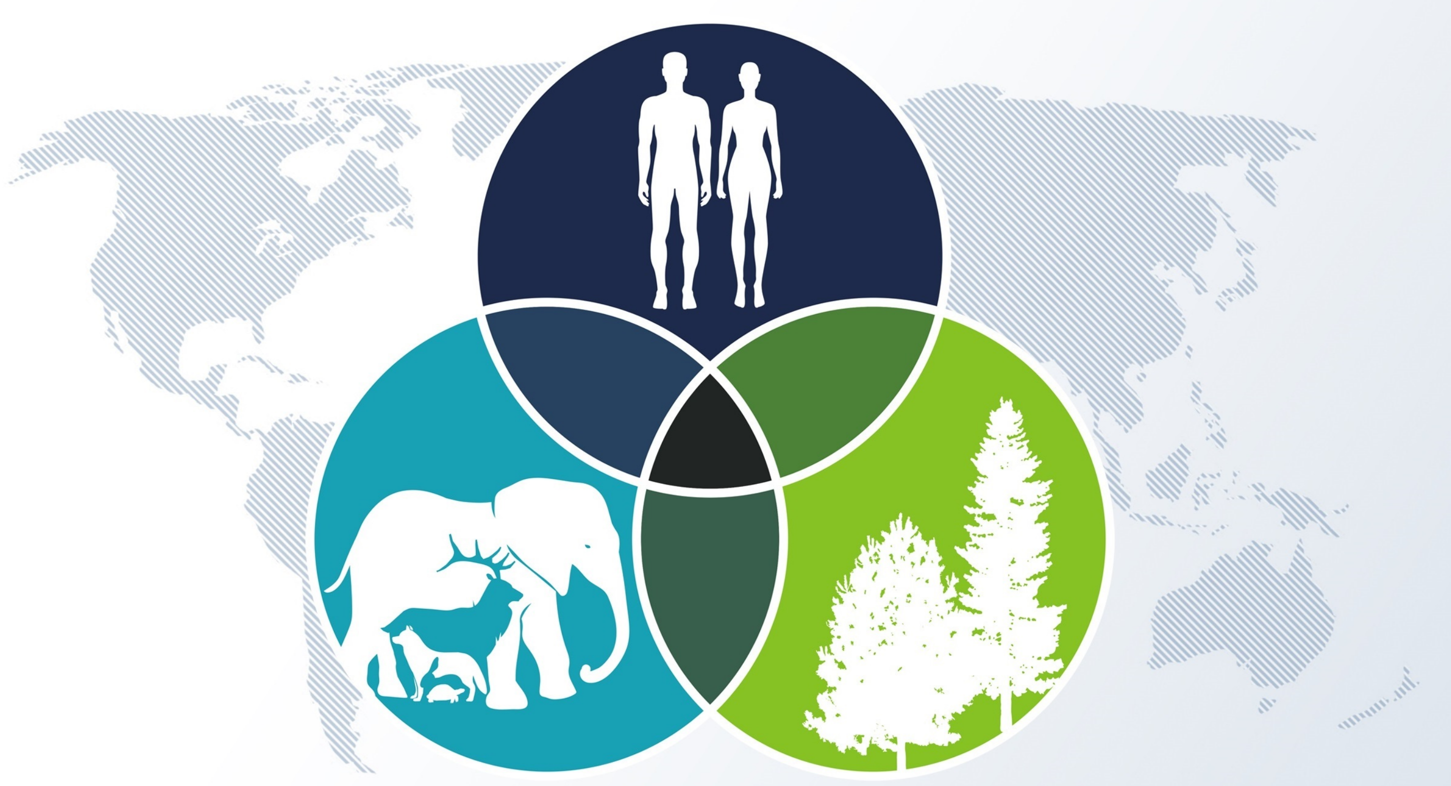
MOLDAVIAN BIOSAFETY AND BIOSECURITY ASSOCIATION



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The Moldovan Association for Biosafety and Biosecurity (MDBBA) is a scientific and practical, instructive and educational, non-governmental, apolitical and non-profit professional organization, created in 2017.

The main objective of the association is the development of good practices and culture in the field of biosafety and biosecurity and the promotion of knowledge within professional and research-innovation groups.

Biosafety – includes security principles, technologies and rules to be followed to prevent unintended exposure to pathogens and toxins or their accidental release/leakage.

"Protection of personnel, population from unintended exposure to pathogens/biohazardous material".

Biosecurity - includes a wide spectrum of measures (biosecurity policies, regulatory regime, scientific and technical measures) applied in an organized framework, necessary to minimize risks (prevention of actions, terrorist attacks by the intentional release of pathogens or toxins as well as loss, their theft or misuse).

"Protection and prevention of theft, intentional misuse of pathologies/biohazardous material".

Risk management – is a decision-making process in which the results of risk assessment (the process of estimating workplace hazards) are integrated with economic, technical, social and political principles to generate strategies for risk reduction.

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Invasive fungal infections in healthcare settings

Oleg BAGRIN,
MD, PhD, DOMP, DO, Professor
Dean of Applied Clinical Sciences,
National University of Medical Sciences,
Naples, FL, USA

Nowadays, many societies are facing a significant demographic shift, according to the WHO. As a result of this phenomenon, there is an imbalance of control leading to Elder Abuse, which is multidimensional. Unfortunately, recurrent elder mistreatment occurs in up to 80% of cases.

Out of many types of violence and abuse, ***Neglect*** *is the most common in our senior population, resulting in serious injuries and illnesses. Any signs of elder neglect such: poor personal hygiene, malnutrition, dehydration, luck of needed medical aids, untreated injuries or infections is an alarm for a prompt reaction of the responsible authorities, but also of society as a whole.*

One Health team is paving the own road towards success and its approach would consider diverse solutions for diverse needs for seniors to thrive: emotional, physical, social, intellectual, spiritual, cultural.

A Chinese proverb is saying: " An elderly person at home is like a golden treasure".

*The "****One Health & Risk Management****" journal is an* ***intellectual treasure****, and also a great source of promoting the values of a healthy society.*

ONE HEALTH & RISK MANAGEMENT

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2023

MEDICAL SCIENCES

COLLABORATION BETWEEN PRIMARY HEALTH CARE AND THE ORTHODOX CHURCH IN THE FIELD OF PUBLIC HEALTH

Galina TURTUREANU, Oleg LOZAN

School of Public Health Management, *Nicolae Testemițanu* State University of Medicine and Pharmacy, Republic of Moldova

Corresponding author: Galina Turtureanu, e-mail: galinaturtureanu86@gmail.com

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Keywords: *primary health care, representatives of the Orthodox church.*

Introduction. *Interconnections between the religious and medical sectors are multifaceted and have existed for centuries, including partnerships that have evolved in recent decades, and integrating religion into health programs can provide some important outcomes for population health.*

Material and methods. *A quantitative study was conducted among family doctors and representatives of the Orthodox church, between January and March 2022. A questionnaire was applied to 347 family doctors and 337 Orthodox priests.*

Results. *Both doctors (60.1%) and priests (79.8%) consider the existence of barriers to cooperation between the two entities. Both doctors and priests see doctors as important actors in solving public health problems (98% and 96% respectively), the local public authority (82% and 53% respectively), while doctors consider the value of the church more important than priests do (45% compared to 31%). Measures that could improve the degree of collaboration between institutions, regular communication between actors is a priority in their view (78.1% doctors and 78% priests), while priests attest that collaboration initiatives from the central authority could increase the degree of collaboration (81.6%), collaboration initiatives from religious institutions could influence this process to a much lesser extent (29.7%).*

Conclusions. *Both doctors and priests confirm the need to increase the degree of involvement in public health activities in the future.*

Cuvinte cheie: *asistența medicală primară, reprezentanții cultului religios ortodox.*

COLABORAREA DINTRE ASISTENȚA MEDICALĂ PRIMARĂ ȘI CULTUL RELIGIOS ORTODOX ÎN DOMENIUL SĂNĂTĂȚII PUBLICE

Introducere. *Interconectările dintre sectorul religios și cel medical sunt multiforme și au existat de secole, inclusiv parteneriate care au evoluat în ultimele decenii, iar integrarea religiei în cadrul programelor de sănătate poate oferi rezultate importante pentru sănătatea populației.*

Material și metode. *A fost efectuat un studiu cantitativ în rândul medicilor de familie și reprezentanților cultului religios ortodox în perioada ianuarie-martie 2022. A fost aplicat un chestionar la 347 de medici de familie și 337 de preoți ortodocși.*

Rezultate. *Atât medicii (60,1%), cât și preoții (79,8%) consideră existența barierelor de conlucrare între cele două entități și îi văd ca și actori importanți în soluționarea problemelor de sănătate publică pe medici (98% și respectiv 96%) , autoritatea publică locală (82% și respectiv 53%), în timp ce medicii consideră valoarea cultului religios mai importantă decât preoții (45%, comparativ cu 31%). Măsurile ce ar putea îmbunătăți gradul de colaborare dintre instituții, comunicarea constantă dintre actori este o prioritate în viziunea acestora (78,1%de medici și 78% de preoți), în timp ce preoții atestă că inițiativele de colaborare din partea autorității centrale ar putea spori gradul de colaborare (81,6%), inițiativele de colaborare din partea instituțiilor cultului religios ar putea influența acest proces într-o măsură mult mai mică (29,7%).*

Concluzii. *Atât medicii, cât și preoții confirmă necesitatea creșterii gradului de implicare în viitor în activități de sănătate publică.*

INTRODUCTION

Interconnections between the faith-based and medical sectors have many dimensions and have existed for centuries, including partnerships that have evolved in recent decades. In a time of scarce health care resources, such partnerships are useful for the work of health care providers in their efforts to protect and maintain the health of the population. At the same time, challenges and obstacles remain, mostly related to the complex relationships between these two sectors. Institutionally, the interaction between religion and medicine has been multidimensional and dynamic, and remains so to this day, providing opportunities for cooperation and collaboration in the service of health promotion and disease prevention (1). Capitalizing on the strengths of religious organizations is important, especially emerging from the trust of the population and the number of followers, and studies have demonstrated significant effects of health programs of religious groups on human behavior, by promoting health among the population (e.g.: balanced nutrition, physical activity, smoking cessation and disease screening) (2). In recent years, there has been increasing recognition in areas related to health and medical sciences that religious and spiritual concerns are important for understanding health-related behaviours, attitudes and beliefs, and are particularly important for people whose health is compromised (3). In the field of clinical practice, several health care institutions and health care centers have initiated programs that incorporate religious/spiritual approaches and content as adjuncts to standard treatment regimens (4).

Aim of study: evaluation of the collaboration between Primary Health Care and the Orthodox church in the field of public health.

MATERIAL AND METHODS

To fulfill the aim of the research, between January and March 2022, a quantitative study was conducted among family doctors and representatives of the Orthodox church. An anonymous and self-administered questionnaire, which included 19 closed questions about the degree, barriers and areas of cooperation, was disseminated through the e-mail addresses of the Public Primary Health Care Institutions as well as within the Dioceses, accompanied by an official letter about the purpose of the research, its practical utility, being applied among 347 family doctors and 337 Orthodox priests. Inclusion criteria: family doctors and Orthodox priests from the Republic of Moldova, age older than 18 years, consent to participate in the study. SPSS version 23 and Microsoft Excel programs were used to create and analyze the database. The 95% confidence interval (CI: 95%) was calculated for the mean scores.

RESULTS

Analyzing the activity environment of the study group, the following were found: that of 347 family doctors, 65.1% are from an urban environment, and 34.9% from a rural environment. On the other hand, among the representatives of the Orthodox church, the opposite distribution was found, the vast majority of respondents, 74.8%, working in the rural environment, and 25.2% in the urban environment.

Analyzing the respondents' knowledge of public health issues and asking if they know what the definition of public health is, 99.4% of family doctors and 96.7% of Orthodox priests answered in the affirmative. However, only 52.6% of family doctors and 31.2% of representatives of the Orthodox church chose the correct version of the definition, according to its formulation in Law No. 10 on state supervision of public health: "*The science and art of preventing disease, prolonging life and promoting health through the organized efforts of the entire society*".

Both family doctors and representatives of the Orthodox church see family doctors as important actors in solving public health problems (98% and 96% respectively), the local public authority (82% and 53% respectively), and mass representatives the media being ranked third by both groups (66% in the case of family doctors compared to 31% of Orthodox priests). It is interesting that family doctors consider the value of the representatives of the Orthodox church in solving public health problems higher than the Orthodox priests themselves (45% compared to 31%).

Both family doctors and Orthodox priests appreciated the importance of partnerships between primary health care and the Orthodox church on a scale from 1 to 10, with an average score of 7.1±0.3 and 7.1±0.2, respectively. The role of Pri-

mary Health Care in solving public health problems was appreciated by family doctors with an average of 8.9±0.1, and representatives of the Orthodox church appreciated it with an average of 8.6±0.2. On the other hand, regarding the role of the religious groups in solving public health problems, family doctors rated them with an average grade of 6.3±0.3, while the Orthodox church self-assessed itself with an average of 7.0±0.2. Representatives of the Orthodox church evaluate their degree of openness towards family doctors in the collaboration of solving public health problems with a score of 8.2±0.2, whereas family doctors evaluate the same indicator with an average of only 5.3±0.3, while the degree of openness of Primary Health Care is evaluated by both samples with approximately equal means (6.3±0.3 – for family doctors and 6.2±0.3 – for Orthodox priests) (fig. 1).

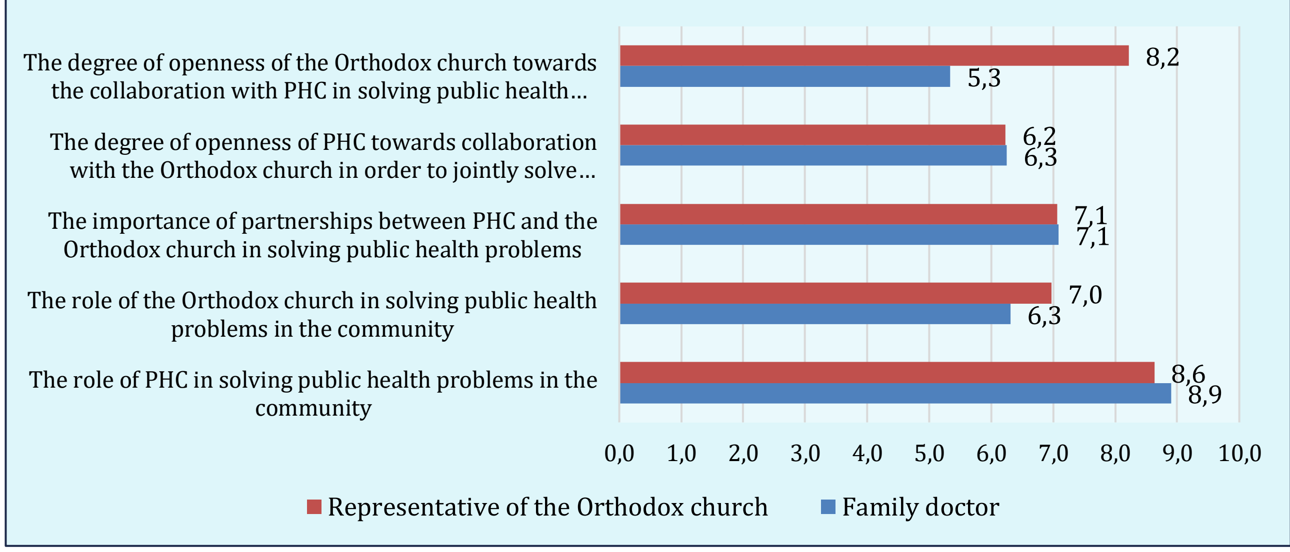

Figure 1. Assessment of the role of Primary Health Care and the Orthodox church, in solving public health problems, (according to the score of 10 points).

Thus, 60.2% of family doctors and 79.8% of Orthodox priests believe that there are barriers to collaboration between Primary Health Care and representatives of the Orthodox church. Family doctors believe that the main barriers to cooperation are: lack of communication between medical institutions and religious groups 59.4%, lack of knowledge in the field of health among the representatives of the religious group 51.6%, while 2/3 of the representatives of the Orthodox church affirmed that religious institutions are not seen as credible partners in solving public health problems 64.7% (tab. 1).

The assessment of the current level of involvement of Primary Health Care and representatives of the Orthodox church in public health activities, on a scale from 1 to 10, depending on the fields in which they are involved, is made by family doctors with means between 5.4 and 6.6, and by Orthodox priests with means of 3.6-6.7. At the same time, both study groups, realizing the need for future involvement in public health activities, the level of future involvement being evaluated by family doctors with means between 8.2 and 8.7, and by representatives of the Orthodox church with 6.4 and 9.0. The areas in which Orthodox priests are least involved at present and also least willing to be involved in the future are: vaccination, involvement in public health emergencies, sex education and prevention of non-infectious diseases (tab. 2).

The majority of family doctors (90%), as well as representatives of the Orthodox church (87%), believe that Orthodox priests need additional training in all areas of public health in order to be effectively involved in solving problems related to the health of the population. Family doctors believe that representatives of religious groups have the least knowledge in areas such as: vaccination (5.7±0.4 points), involvement in public health emergencies (6.0±0.3 points) and prevention of non-infectious diseases (6.2±0.3 points), and they possess the most knowledge in reducing unhealthy behaviors (7.4±0.3 points).

Table 1. The main existing cooperation barriers between Primary Health Care and representatives of the Orthodox church (%).

Indicators	Family doctors	Representatives of the Orthodox church
Prohibitions from the clerical leadership	22.5	4.7
Prohibitions from the management of the medical institution	11.5	15.4
Lack of motivation on the part of doctors	23.3	26.7
Lack of motivation on the part of representatives of religious groups	30.8	18.1
Lack of knowledge in the field of health among the representatives of the church	51.6	13.6
Lack of communication between medical institutions and religious groups	59.4	44.8
The role and possible ways of involving the representatives of religious groups in the solution of public health problems is not understood	47.8	28.8
Mutual distrust	37.8	24.0
Religious institutions are not seen as credible partners in solving public health problems	37.8	64.7

Table 2. The level of current and future involvement of family doctors and Orthodox priests in public health activities (according to the score of 10 points).

Areas of collaboration	Family doctors		Orthodox church representatives	
	Current	Future	Current	Future
Promoting a healthy lifestyle	6.4	8.7	5.9	8.9
Increasing the level of sanitary culture of the population	6.3	8.6	5.8	8.9
Mental health (depression states, suicide prevention, etc.)	6.3	8.5	6.2	9
Reducing unhealthy behaviors (alcohol, tobacco, drug use)	6.6	8.6	6.7	9
Prevention of infectious diseases, including prevention and control of tuberculosis, HIV infection, etc.	5.9	8.4	5.4	8.7
Sexual education	5.7	8.4	4.5	7.7
Prevention of non-infectious diseases (cardiovascular diseases, cancer, diabetes, etc.)	5.6	8.3	4.2	8
Vaccination	5.4	8.4	3.6	6.4
Involvement in public health emergencies (epidemics, floods, earthquakes, accidents, etc.)	5.5	8.2	3.7	7.7

Among the measures that could improve the degree of collaboration between representatives of the Orthodox church and primary health care, family doctors (78.1%) to the same extent as representatives of the Orthodox church (78.0%) consider it to be one of the priorities to good and regular communication between actors. Representatives of the Orthodox church believe that collaboration initiatives from the central authority would increase the degree of collaboration between primary health care and representatives of the Orthodox church (81.6%), while collaboration initiatives from religious institutions could influence this process to a much lesser extent (29.7%) (tab. 3).

Table 3. Measures that could improve the degree of collaboration (%).

Indicators	Family doctor		Orthodox church representative	
	Yes, it could improve	No, it couldn't improve	Yes, it could improve	No, it couldn't improve
Collaborative initiatives from the medical institution	64.8 %	35.2 %	57.0 %	43.0 %
Collaborative initiatives from the central authority (ministry, government)	61.7 %	38.3 %	81.6 %	18.4 %
Collaborative initiatives from the religious institution	59.7 %	40.3 %	29.7 %	70.3 %
Mechanisms of motivation from the state to support collaboration	56.8 %	43.2 %	62.3 %	37.7 %
Better and regular communication between primary health care doctors and representatives of religious groups	78.1 %	21.9 %	78.0 %	22.0 %

Assessment of the collaboration between Primary Medical Care and the Orthodox church in solving public health problems in the future, both family doctors and representatives of the Orthodox church estimated with a maximum average of 8.3±0.2 versus 9.2±0.1 points, both actors realize the importance of inter-institutional partnerships.

DISCUSSIONS

Today, the role of religion in health promotion is given too little attention in most public health programs. When religion is discussed, health progress is often an impediment to the public, but overall religious participation is a powerful resource for health. In order to practically achieve a sustainable partnership between Medicine and the Church, there must be a change in values, attitudes, behaviors at the level of all the social factors involved: doctors, teaching staff, family, priests. These partnerships must be built on an open system, be in a direct relationship with its external and inherent environment, with the community within which it operates. The United Nations Millennium Development Goals present opportunities to consider how best to link the public sector and civil society, including faith-based organizations, to ensure increased coverage and access to health services. Micro-regional religious entities and health resources are usually interconnected with religious institutions, ecumenical networks or faith-based international development agencies.

We recognize that some representatives in both communities may be skeptical of the usefulness of such partnerships or will recall unquestionable examples of positions taken by some religious groups that often appear harmful to public health, such as refusing vaccines or limiting women's reproductive health care. Professionals in these two fields have a deep understanding of the nature and power of organizations and how to get things done at scale when actors share common commitments and responsibilities and participate together across sectors. Institutionally, the encounter between religion and medicine was multidimensional and dynamic and remains so today. The many intersections between these two institutional sectors offer productive opportunities for cooperation and collaboration in the service of health promotion and disease prevention within populations.

CONCLUSIONS

1. Both family doctors and representatives of the Orthodox church recognized the priority role of actors such as PHC and local public administration in promoting health, Orthodox priests considering their role less important (31%), and the main barrier mentioned by them being the fact that the religious institutions are not seen as credible partners in solving public health problems (64.7%).
2. Equally appreciated is the importance of partnerships between PHC and the Orthodox church in

solving public health problems, although the degree of openness of the Orthodox church, in the opinion of family doctors, is estimated as low.

3. The collaboration between PHC and the Orthodox church is affected by the following barriers: insufficient knowledge of the church representatives in the field of health (51.6%), lack of communication between these actors (59.4%), representatives of the Orthodox church believe that they are not even seen as partners in solving public health problems (64.7%).
4. Both family doctors and Orthodox priests believe that they are open to a much closer collaboration and show openness for future involvement in solving public health problems. However, family doctors evaluate the degree of openness of priests as being lower, with an average of only 5.3 points (on a scale from 1 to 10).
5. The majority of family doctors (90%), as well as representatives of the Orthodox church (87%), believe that priests need additional training in all areas of public health in order to be effectively involved in solving problems related to the health of the population.

CONFLICT OF INTERESTS

The authors have no conflict of interest to declare.

ETHICAL APPROVAL

Ethics committee approval was not required.

REFERENCES

1. Campbell MK, Hudson MA, Resnicow K, Blakeney N, Paxton A, Baskin M. Church-Based Health Promotion Interventions: Evidence and Lessons Learned. *Annual Review of Public Health*. 2007; 28:1, 213-234. doi:10.1146/annurev.publhealth.28.021406.144016
2. Idler E, Levin J, VanderWeele T, Khan A. Partnerships Between Public Health Agencies and Faith Communities. *American Journal of Public Health*. 2018. doi:10.2105/AJPH.2018.304941
3. Bearon LB, Koenig HG. 6 Religious cognitions and use of prayer in health and illness. *Gerontologist*. 1990;30(2):249-253. doi:10.1093/GERONT/30.2.249
4. Dogra N, Giordano J, France N. 5 Cultural diversity teaching and issues of uncertainty: The findings of a qualitative study. *BMC Med Educ*. 2007;7. doi:10.1186/1472-6920-7-8

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MEDICAL SCIENCES

KNOWLEDGE, ATTITUDES AND PRACTICES OF THE POPULATION REGARDING OSTEOPOROSIS

Aurelia DONESCU[1,2], Oleg LOZAN[1]

[1]School of Public Health Management, Chisinau, the Republic of Moldova

[2]Diagnostic Consultative Center of IMSP Territorial Medical Association Ciocana, Chisinau, the Republic of Moldova

Corresponding author: Aurelia Donescu, e-mail: aurelia69@mail.ru

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Keywords: *osteoporosis, knowledge, attitudes, practices, risk factors, health decision factors, prevention.*

Introduction. *Introduction. Osteoporosis is a skeletal disease characterized by compromising the mechanical strength of the bone and increasing the risk of fractures. Osteoporosis conditions the increase in illness and disability in the elderly and, respectively, leads to an increase in health expenses.*

Material and methods. *A cross-sectional descriptive epidemiological study was designed, which included surveying 423 respondents and interviewing representatives of health decision-makers (6 in-depth interviews), during 2020-2022.*

Results. *In the section on knowledge about osteoporosis, a dissociation of responses was recorded according to the gender criterion – women in 65.4% of cases know better about this problem (χ2=3.898, p=0.273). Knowledge about the fact that osteoporosis can occur during menopause was demonstrated by 45.9% of respondents, of whom women in 76.3% of cases (χ2=36,136,183, p<0.001). The attitude of the respondents was analyzed according to the biological gender. It was found that women show concern about osteoporosis in 63.6% of cases, and men – 35.2%. In the practices chapter, it was found that the respondents consume little milk and cottage cheese, but they usually take calcium food supplements (54%).*

Conclusions. *Osteoporosis is a current public health problem. Females possess more knowledge about osteoporosis and show a more expressive attitude compared to males.*

Cuvinte cheie: *osteoporoza, cunoștințe, atitudini, practici, factori de risc, factori de decizie din domeniul sănătății, prevenire.*

CUNOȘTINȚE, ATITUDINI ȘI PRACTICI ALE POPULAȚIEI PRIVIND OSTEOPOROZA

Introducere. *Introducere. Osteoporoza este o boală a scheletului caracterizată prin compromiterea rezistenței mecanice a osului și creșterea riscului de fracturi. Osteoporoza condiționează creșterea îmbolnăvirii și a dizabilității persoanelor de vârstă înaintată și respectiv, duce la creșterea cheltuielilor în sănătate.*

Material și metode. *A fost proiectat un studiu epidemiologic descriptiv transversal, care a inclus chestionarea a 423 de respondenți și intervievarea reprezentanților factorilor de decizie din domeniul sănătății (6 interviuri în profunzime), în perioada 2020-2022.*

Rezultate. *La capitolul cunoștințe despre osteoporoză s-a înregistrat o disociere a răspunsurilor după criteriul de gen – femeile, în 65,4% cazuri, cunosc mai bine despre această problemă (χ2=3.898, p=0.273). Cunoștințe despre faptul că osteoporoza poate apărea în perioada de menopauză au demonstrat 45,9% dintre respondenți, dintre care femeile în 76,3% cazuri (χ2=36.136.183, p<0.001). A fost analizată atitudinea respondenților în funcție de genul biologic. S-a constatat că femeile manifestă îngrijorare față de osteoporoză în 63,6% cazuri, iar bărbații – 35,2%. La capitolul practici s-a constatat că, respondenții consumă puțin lapte și brânză de vaci, însă obișnuiesc să administreze suplimente alimentare cu calciu (54%).*

Concluzii. *Osteoporoza este o problemă actuală de sănătate publică. Persoanele de gen feminin posedă mai multe cunoștințe despre osteoporoză și manifestă o atitudine mai expresivă în raport cu bărbații.*

INTRODUCTION

Osteoporosis presents a problem of global importance and was placed by the WHO in the list of diseases related to the aging of the population. According to the WHO definition, "osteoporosis is a systemic disease characterized by a low bone mass and the alteration of the microarchitecture of the bone tissue that causes an increase in bone fragility and consequently an increase in the risk of fracture" (1, 2, 3). The social importance of osteoporosis is assessed through its consequences – fractures of the vertebrae and the bones of the peripheral skeleton, it conditions the increase of illness, invalidism and mortality of the elderly and, respectively, the increase of expenses. Thus, it is certain that osteoporosis is a public health problem (4). The most recent statistics speak of a mortality rate of about 20% of patients with hip fractures, who die in the first 6 months after the fracture. About 1/2 of hip fracture survivors have a poor quality of life, and about 1/3 become dependent and require long-term care. Vertebral fractures cause severe pain and immobilization and increase direct costs. Vertebral fractures also cause deformities, kyphoscoliosis, limitation of movements and height loss, all of which have an impact on daily life, self-esteem and quality of life (5, 6).

In Europe (2017), there were an estimated 162,000 new hip fractures, 574,000 forearm fractures, 250,000 proximal humerus fractures, and 620,000 clinical vertebral fractures in men and women aged 50 years and older (7). These fractures represented 34.8% of such fractures worldwide. Osteoporotic fractures also occur at many other levels including the pelvis, ribs, distal femur and tibia. In total, all osteoporotic fractures account for 2.7 million fractures in men and women in Europe, at a direct cost of €36 billion (8). An estimate from the last decade calculated the direct costs at 29 billion euros in the five largest European countries (France, Germany, Italy, Spain and the United Kingdom) and 38.7 billion in the 27 member states of the European Union. It is widely recognized that osteoporosis and subsequent fractures are associated with increased mortality, with the exception of forearm fractures. The number of deaths causally related to osteoporotic fractures was estimated at 43,000 in the European Union. Approximately 50% of fracture-related deaths in women were due to hip fractures, 28% to clinical fractures, 7% to vertebral fractures, and 22% to other fractures. In case of hip fracture, most deaths occur in the first 3-6 months after the event, of which 20-30% are causally related to the fracture event itself. Life expectancy in menopausal women after a hip or vertebral fracture is lower than in women with breast cancer (approximately 12%). Also, the probability of a fracture at any of these levels is 40% or more in Western Europe, a figure close to the probability of coronary heart disease. In Europe, osteoporosis accounted for more disability and years of life lost than rheumatoid arthritis, but less than osteoarthritis. By comparison with neoplastic diseases, disability due to osteoporosis was greater than for all types of cancer except lung cancer (9, 10). These figures can also be extrapolated for the Republic of Moldova, probably with a more severe impact (11).

The aim of the study was to assess the knowledge, attitudes and practices of the population regarding osteoporosis and the opinions of decision-makers in the field of health, in order to develop the set of recommendations for the prevention of this condition among the adult population.

MATERIAL AND METHODS

In order to achieve the purpose of the research, a cross-sectional descriptive epidemiological study was designed, which included a survey of the general population and in-depth interviews of representatives of health decision-makers, during the years 2020-2022. The following methods were used: historical, descriptive, comparative, sociological, mathematical and statistical. The target population was rural and urban adults. People from the three geographical areas of the Republic of Moldova participated in the survey. Ocnita and Glodeni districts were selected from the Northern area, Chisinau municipality, Anenii-Noi and Ungheni districts from the Central area, and Cantemir and Cimislia districts from the Southern area.

In the study, 423 respondents (adult population) were interviewed, from the Republic of Moldova, urban and rural areas. To determine the number of respondents, the calculation formula $n=P(1-P)(z/e)^2$ was used, where the significance of the results was 95%, and the non-response rate – 10%. The criteria for inclusion in the study were: (i) the age of the persons (over 18); (ii) consent to

participate in the study. As part of the research, the "Knowledge, Attitudes and Practices of the population regarding osteoporosis" questionnaire was developed and applied. The questionnaire was structured in four sections and included 69 questions.

For the in-depth interview, 6 people were selected (representative of the CNAM, the National Public Health Agency, the Ministry of Health, the Department of Family Medicine of USMF "Nicolae Testemițanu", managers of the urban and rural Primary Health Care institutions). In the course of the interview, the interviewees were given questions, aimed at the topic addressed, to which they were answered either with short answers: yes, no, I don't know, or extensive, reasoned and exemplified answers were given. The data were processed by: SPSS 27.0.

RESULTS

Socio-demographic characteristic

The researched sample consisted of 423 adults. The age of the respondents was between 18 and 82 years, with an average of 46.2±14.44 years (M±SD). The structure of the sample by age category was: people aged 18-30 constituted 15.1% (64 people), 31-60 years – 64.5% (273 people) and 61 years and over – 20.3% (86 people). In the study, female participation prevailed, which constituted 64% (270 women), compared to 36% (153 men). More than half of the participants in the survey - 53% (225 people) came from rural areas, and 47% (198 people) lived in urban areas. Out of the total number of people included in the research sample, most – 41% (171 people) declared that they have specialized secondary education, followed by 36% (153 people) with higher education. Without education, 11% (48 people) were identified with a secondary education level, and respectively, 8% (34 people) with a high school education. It is curious that 4% (17 people) selected another level of education, this can be explained by the fact that the respondent did not identify with any category of studies proposed by the researcher. Depending on the marital status, the majority of respondents – 71% (299 people) declared that they were married, and 12% (51 people) – not married. A small number of respondents – 8% (35 people) declared that they were widowed, 5% (21 people) – divorced and 4% (17 people) lived in cohabitation. A relevant aspect of the study was the questioning of the respondents regarding the specifics of the work performed. Thus, for 45.4% (192 people) the specifics of professional or household activities were characterized as predominantly sedentary (sitting), and 54.6% (231 persons) characterized the nature of professional or household activities as predominantly standing (moving).

Assessment of respondents' knowledge of osteoporosis

When asked whether osteoporosis can be caused by a diet low in dairy products, most respondents (42.3%) answered "probably", which proves that they have knowledge about the association of the disease and dairy products, and only 4% did not know. The dissociation of the responses by gender demonstrated that women in 65.4% of cases know better about this problem ($\chi2=3.898$, $p=0.273$). Knowledge about the fact that osteoporosis can occur during menopause was demostrated by 45.9% of respondents, of whom women in 76.3% of cases ($\chi2=36,136,183$, $p<0.001$). Regarding the diet rich in green leafy vegetables and the development of osteoporosis, here the respondents were undecided in their answer, thus showing the lack of a unipolar position. Contrary to what was mentioned, the majority of respondents (44.4%) agreed with the statement that the disease is more widespread in families with a family history. A noticeable connection between removed ovaries and the development of the disease was not observed by 34.5% of respondents. Respondents who agree (32.4%) and who do not agree (32.6%) with the fact that the administration of cortisone for a long period of time can lead to the development of the disease were in practically equal positions. It should be noted that 47.8% of people do not consider that physical exercise plays an important role in the development of osteoporosis. Resulting from the above statement, a characteristic of the respondents was made according to their perception about the role of exercise in reducing the chance of getting the disease. Most respondents stated that brisk walking is more important compared to swimming, and housekeeping activities are not essential ($\chi2=20.183$, $p=0.017$).

The aim was to see what knowledge the respondents possessed about calcium, as one of the elements that the human body needs to maintain strong bones. Respondents expressed themselves on the question by giving preference to certain food products, which in their opinion have a

higher calcium content (tab. 1).

Thus, preference was given to cottage cheese (83.2% cases), canned sardines (57.2%), broccoli (47.3%), yogurt (65.5%), ice cream (34.5%). At the opposite pole are the following products: cucumbers and apples (7.1% each), watermelon (8.5%), grapes (7.3%), strawberries (5.4%), radishes (14.2%).

Assessing respondents' attitudes about osteoporosis

People in the 18-30 and 31-60 age groups have a more neutral than affirmative attitude and believe that the chances of developing osteoporosis are minimal, compared to people in the over 60 age group, who show a strongly convinced attitude towards this issue. The majority of respondents in the age group 31-60 years are of the opin ion that they are more likely to have osteoporosis compared to the age group 18-30 years (6.3%) ($\chi2=46.181$, $p<0.001$).

The attitude of the respondents was analyzed according to sex (fig. 1). It was found that the manifestation of concern about osteoporosis was higher in women (63.6%) than in men (35.2%).

Table 1. Rate of respondents' preferences for a particular food product.

Food product	Rate	The nutritional content of calcium per 100 g
Cottage cheese	83.2%	400 mg
Canned sardines	57.2%	382 mg
Broccoli	47.3%	47 mg
Yogurt	65.5%	125 mg
Ice cream	34.5%	142 mg
Cucumber	7.1%	16 mg
Apples	7.1%	6 mg
Watermelon	8.5%	7 mg
Grapes	7.3%	19 mg
Strawberries	5.4%	16 mg
Radish	14.2%	25 mg

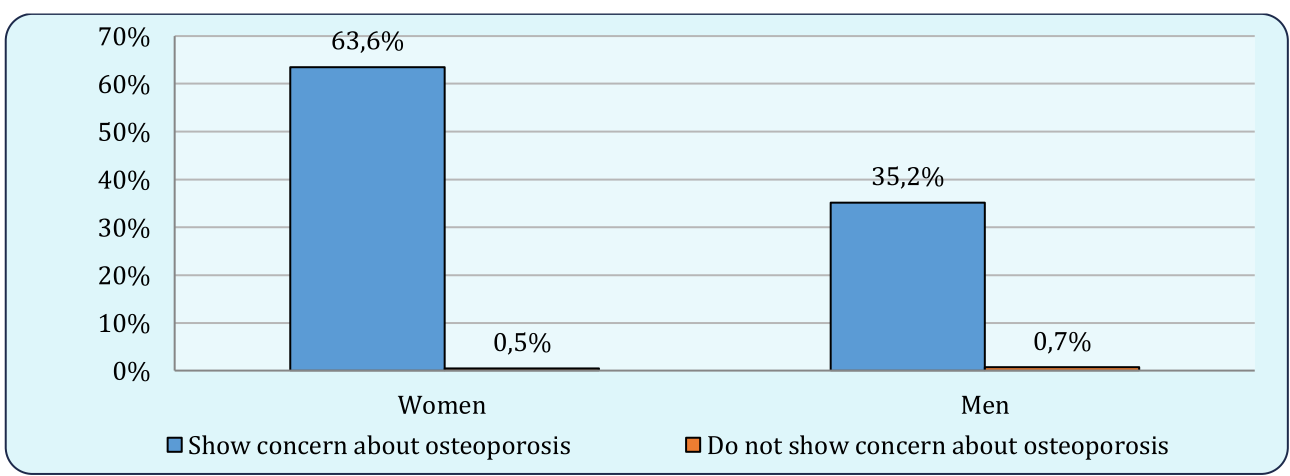

Figure 1. Respondents' attitude towards osteoporosis according to sex.

Another studied aspect, which aroused curiosity, was highlighting the character of the respondents' attitudes towards osteoporosis depending on the level of education. In all cases, concern prevailed. The majority are respondents with secondary education – 40%, followed by respondents with higher education – 35.7%, secondary school – 11.1% and high school – 8.1%. The lack of concern was practically not reported.

Assessment of respondents' practices regarding osteoporosis

Another aspect, which was one of the objectives of the research, was the evaluation of the prac-

tices of the people questioned regarding the problem of osteoporosis. It was aimed to quantify the results about some healthy practices that the respondents adopted during their life. These practices are directly proportional to the level of knowledge about osteoporosis and to the attitudes shown by the respondents towards this disease.

Taking into account the general recommendations regarding the prevention of osteoporosis, respondents were asked the question about the habit and frequency of milk consumption during their lifetime (fig. 2).

Respondents consume little milk, which does not correspond to the recommendations of specialists regarding the consumption of food products rich in calcium.

The analysis of the frequency of consumption of cottage cheese allowed to highlight that the majority of respondents fall into the category of those who consume cottage cheese 1-2 servings a week. At the same time, the number of those who do not consume cottage cheese is high (fig. 3).

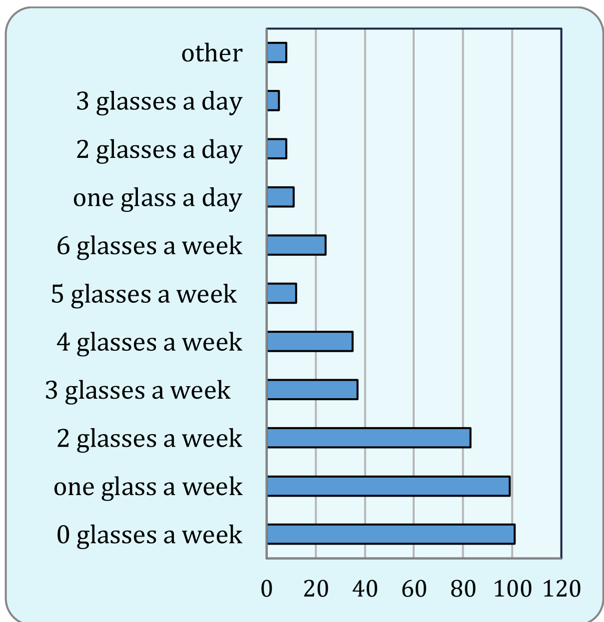

Figure 2. Frequency of milk consumption by respondents (abs.).

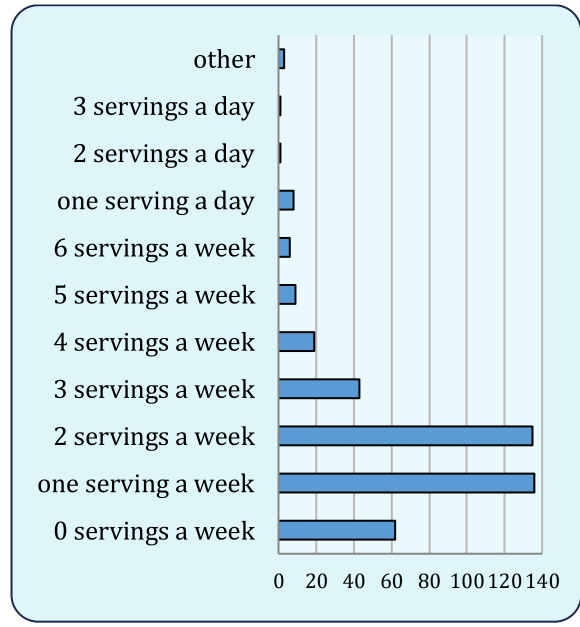

Figure 3. Frequency of consumption of cottage cheese by respondents (abs.).

At the opposite pole of consuming food products rich in calcium and supplying the body with the necessary amount of calcium naturally, is the administration of food supplements with a calcium content. These supplements are administered to supplement the body's calcium needs, for prophylactic or treatment purposes. It found that 54% of respondents take calcium supplements and 46% do not use such supplements. The majority of respondents who administer calcium supplements are those with specialized secondary education – 20.8%, with higher education – 15.1%, with secondary education – 4.5% and with high school education – 4%.

Analysis of health policy makers' views on osteoporosis

In-depth interviews were conducted to assess health policy-makers' views on their capacity and contribution to strengthening the population's knowledge, attitudes and practices regarding osteoporosis. This qualitative method is used when it is desired to avoid distortion of individual opinion through interaction in a focus group. An in-depth interview is usually recorded, has a discussion topic with predetermined questions, and is conducted by a moderator. The most relevant opinions expressed were: *"Osteoporosis is a Public Health problem in our country, being a degene-rative and metabolic disease"; "The problem of osteoporosis in our country is ignored, ...as long as it is not in the top 5 causes of mortality..."; "I don't consider osteoporosis as a Public Health problem, as long as we don't know the number of people with osteoporosis in the country".* The people interviewed reported that *„...at the national level, a Strategy for the prevention and reduction of non-*

communicable diseases was developed for the years 2012-2020, ... osteoporosis as a non-communicable disease was not included in the list...".

The respondents came up with some recommendations on the improvement of the situation regarding osteoporosis: *"...we should follow protocol and assess all risk factors..."; "...reducing risk factors among the population..."; "...investigations should be more accessible, and included in the unique program, covered by the medical insurance policy".*

DISCUSSIONS

It is certain that osteoporosis is a public health problem (12, 13) and there are premises that the challenges it poses to us will increase in the near future. The fact is mainly due to the increase in population on a global scale and the increase in the share of elderly people within it. The risk of osteoporosis increases with age, especially in women (14, 15). After the age of 30, bone tissue begins to break down, bone consistency decreases (the phenomenon of bone resorption), and bone development is reduced (16).

The most recent statistics speak of a mortality rate of about 20% of patients with hip fractures, who die in the first 6 months after the fracture. The greatest impact on the daily life, self-esteem and quality of life of people suffering from osteoporosis are vertebral fractures that cause severe pain, deformities, kyphoscoliosis, limitation of movements, height loss and immobilization, which causes increased direct costs (5, 8).

The PREVOSS (Prevalence of Postmenopausal Osteoporosis) study, conducted in Romania, included 2,881 postmenopausal women from 6 large cities of the country and allowed the calculation of a standardized prevalence of the disease of 18.4%, to which 15.8% women with osteopenia is added. The standardized rate of fragility fractures was 5.97% (7). The statistics of the EU countries, as well as from Romania, are worrying. These figures can be extrapolated for the Republic of Moldova, probably with a more severe impact (11). Despite its impressive medical and socio-economic impact, osteoporosis does not seem to be taken too seriously by society. If 93% of women in the European area are well informed about the severity of the disease and the consequences arising from it, 80% do not think that they are personally at risk. More than 75% of women who have already suffered a forearm fracture did not undergo densitometry and did not receive drug treatment. In Norway, only 1.5% of women with osteoporosis are on sustained drug treatment, and continent-wide only 19% of those who have suffered a fracture receive prophylaxis for those likely to follow. In Romania, only 12.4% of women with osteoporosis are included in treatment and compliance with it is poor. Such negative attitudes are the combined result, in varying proportions, of poor allocation of funds and lack of treatment adherence.

CONCLUSIONS

1. As a result of the research, a higher level of knowledge was attested, with reference to osteoporosis, in women in 63.8% of cases, compared to men – 36.2%. The knowledge deficit in men may be associated with a lack of information and awareness of the symptoms and pathologies associated with osteoporosis.
2. Women showed interest in 63.6% of cases, while disinterest was observed more frequently among men. A more responsible and caring attitude towards osteoporosis was shown by people with specialized secondary education (40%) and higher education (35.7%), followed by those with secondary education (11.1%) and high school education (8.1%).
3. In the Republic of Moldova, the problem of osteoporosis and its consequences is not among the priority diseases, which causes this disease to be underdiagnosed.

RECOMMENDATIONS

For the Ministry of Health and the National Agency for Public Health:

1. Launch of information and education campaigns for the population regarding the risk of osteoporosis by distributing informative materials.
2. Policy and National Programs development aimed at reducing osteoporosis morbidity rate.
3. Development of educational programs for the population, focusing on the acquisition of know-

ledge and practical skills regarding osteoporosis.
4. Training specialists in the management and prevention of osteoporosis.
5. Adopting the practices of other countries regarding the management and prevention of osteoporosis.

For the National Health Insurance Company:
1. Directing financial funds towards preventive measures to reduce risk factors in the development of osteoporosis.
2. Increasing physical and economic accessibility of the population to DXA investigation for the pupose of diagnosing osteoporosis.

For Primary Health Care:
1. Identifying and monitoring the population with risk factors in the development of osteoporosis.
2. Current application of the FRAX tool.
3. Increasing the number of people benefiting from compensated antiresorptive treatment.

For the population:
1. Exercising 30-40 minutes, 3-4 times a week.
2. Adopting a rational diet that includes enough calcium.
3. Discovering calcium-rich alternatives for vegetarians and those with dairy intolerance.
4. Supplementing the body with vitamin D, through outdoor walks.
5. Avoiding smoking and drinking alcohol.
6. Encouraging the limitation of consumption of products with a negative impact (coca-cola, coffee, sausages, processed products, fast food, etc.).

CONFLICT OF INTERESTS

The authors have no conflict of interest to declare.

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The article represents a synthesis of the results of the study carried out as part of the master's thesis defended in 2022 at the School of Public Health Management.

ETHICAL APPROVAL

The article was not approved by the Ethics Committee because it does not contain ethical risks. The research consists of a survey of adults that maintains all rigors to anonymize the data and preserve the confidentiality of the participants.

REFERENCES

1. American Association of Clinical Endocrinologists Osteoporosis Task Force. American Association of Clinical Endocrinologists 2001 Medical Guidelines for Clinical Practice for the Prevention and Management of Postmenopausal Osteoporosis. *Endocr Pract*. 2001;7(4):293-312. Available from: https://pubmed.ncbi.nlm.nih.gov/11508261/ [Accessed 04.03.2021].
2. Evaluarea riscului de osteoporoză [Osteoporosis risk assessment]. Available from: https://www.osteoporosis.foundation/sites/iofbonehealth/files/2020-10/OsteoporosisRiskCheck_Leaflet_romanian.pdf [Accessed 15.03.2022].
3. Ganea N, Groppa L, Babiuc C, Popa S, Pascari-Negrescu A, Bodrug I, Chişlari L, Bujor O. Osteoporoza secundară: viziuni contemporane asupra bolii [Secondary osteoporosis: contemporary views on the disease]. *Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţe Medicale*. 2011;3(31):189-192. Available from: https://ibn.idsi.md/sites/default/files/imag_file/Osteoporoza%20secundara.pdf [Accessed 15.03.2022].
4. Baltă MD, Iancu MA. Noi abordări ale osteoporozei în asistenţa medicală [New approaches to osteoporosis in healthcare]. *Practica medicală*. 2017;12:4(53). doi:10.37897/RJMP.2017.4.2
5. Ramli N, Rahman NAA, Haque M. Knowledge, Attitude, and Practice Regarding Osteoporosis Among Allied Health Sciences Students in a Public University in Malaysia. *Erciyes Med J*. 2018;40(4):210-7. doi:10.5152/etd.2018.18103
6. Rizzoli R. Zoledronic Acid for the treatment and prevention of primary and secondary osteoporosis. *Ther. Adv. Musculoskelet. Dis.* 2010;2:3-16. doi:10.1177/1759720X09352920
7. Servier Pharma: Studiu epidemiologic al prevalenţei osteoporozei postmenopauză în România [Servier Pharma: Epidemiological study of the

prevalence of postmenopausal osteoporosis in Romania]. 2017.
8. Raisz LG. Pathogenesis of osteoporosis: concepts, conflicts, and prospects. *J Clin Invest*. 2005;115: 3318-3325. doi:10.1172/JCI27071
9. Groppa L, Golubciuc S. Osteoporoza – particularităţi de diagnostic clinic şi paraclinic [Osteoporosis - particularities of clinical and paraclinical diagnosis]. *Buletinul Academiei de Ştiinţe a Moldovei. Ştiinţe Medicale*. 2006;1(5):90-94. Available from: https://ibn.idsi.md/sites/default/files/imag_file/18.Osteoporoza_Particularitati%20de%20diagnostic%20clinic%20si%20paraclinic.pdf [Accessed 15.03.2022].
10. National Osteoporosis Foundation. America's Bone Health: The State of Osteoporosis and Low Bone Mass in Our Nation. Washington, DC: National Osteoporosis Foundation. 2008. Available from: https://www.bonehealthandosteoporosis.org/about-us/nof-background/ [Accessed 15.03.2022].
11. Protocolul Clinic Naţional „Osteoporoza la adult PCN-85" [Osteoporosis in adults PCN-85], 2018. Available from: https://msmps.gov.md/wp-content/uploads/2020/07/15573-PCN-8520Osteoporoza20la20adult.pdf [Accessed 12.03.2022].
12. Alamri FA, et al. Knowledge, attitude, and practice of osteoporosis among Saudis: a community-based study. *The Journal Of The Egyptian Public Health Association*. 2015;90.4:171-177. doi:10.1097/01.EPX.0000475735.83732.fc
13. El Tohami K, Sami W, AL Eidan A, AL Mubarak M, Alotaibi F. Study of Knowledge, Attitude and Practice of Osteoporosis among Adult Women in Majmaah City, Saudi Arabia. *International Journal of Health and Rehabilitation Sciences*. 2015;4(3):185-192. doi:10.5455/IJHRS.00000087
14. Agarwal J, Badkur P. Knowledge, attitude and preventive practice of women concerning osteoporosis above 45 years women. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2018;7(9):3863-3867 Available from: https://www.ijrcog.org/index.php/ijrcog/article/view/5411 [Accessed 08.04.2022].
15. Hasni E, Yew JM. Knowledge and practices of osteoporosis preventive measures among women in a tertiary teaching hospital. *The Malaysian Journal of Nursing*. 2021;12(4):77-86. Available from: https://ejournal.lucp.net/index.php/mjn/article/view/1297 [Accessed 08.04.2022].
16. Melton LJ, Crischilles EA, Cooper C. et al. How many women have osteoporosis? *J Bone Miner Res*. 1992;7:1005-1010. doi:10.1002/jbmr.5650070902

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KNOWLEDGE, ATTITUDES, AND PRACTICES OF PARENTS REGARDING FOOD DIVERSIFICATION FOR CHILDREN UNDER 3 YEARS OLD

Ana ANI, Alina TIMOTIN, Oleg LOZAN

School of Public Health Management, *Nicolae Testemitanu* State University of Medicine and Pharmacy, the Republic of Moldova

Corresponding author: Ana Ani, e-mail: aniaa67761@gmail.com

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Keywords: *children under 3 years old, parents, nutrition, attitude, diversification, nutritional knowledge, habits, eating habits, recommended foods.*

Introduction. *Children suffer the consequences of poor nutrition and improper eating practices for the rest of their lives. Every year, more than 3.4 million children under the age of 5 die due to inadequate feeding practices. Optimal nutrition decreases morbidity and mortality, reduces the risk of chronic diseases and promotes better development.*

Material and methods. *A mixed study was conducted. Quantitative study: the survey was carried out, based on a sample of 423 adults from the Republic of Moldova, who have at least one child aged 3 years. The qualitative study involved 4 focus group meetings with different categories of participants (family doctors, paediatricians, parents) and an in-depth interview – with a representative of the Ministry of Health.*

Results. *Aspects regarding the identification of barriers and opportunities for the development of parents' skills in the process of diversifying the nutrition of children up to 3 years of age and the evaluation of parental knowledge, attitudes and practices were reflected.*

Conclusions. *Although the proper nutrition for children aged 0-3 is currently being studied and argued, there are difficulties in the practical application of the diversification process, conditioned by: inadequate information of parents, lack of reliable evidence-based information sources, and the precarious socio-economic state currently existing in the country.*

Cuvinte cheie: *copii până la 3 ani, părinți, alimentație, atitudine, diversificare, cunoștințe nutriționale, obiceiuri alimentare, alimente recomandate.*

CUNOȘTINȚE, ATITUDINI ȘI PRACTICI ALE PĂRINȚILOR PRIVIND DIVERSIFICAREA ALIMENTAȚIEI COPIILOR PÂNĂ LA VÂRSTA DE 3 ANI

Introducere*. Copiii suportă tot restul vieții consecințele unei alimentații proaste și a unor practici alimentare necorespunzătoare. În fiecare an, din cauza practicilor de alimentație neadecvate, mor peste 3,4 milioane de copii cu vârsta sub 5 ani. O alimentație optimă scade procentul morbidității și al mortalității, reduce riscul de boli cornice și favorizează o dezvoltare mai bună a copiilor.*

Material și metode. *S-a efectuat un studiu mixt. În cadrul studiului cantitativ a fost realizată chestionarea pe un eșantion de 423 de persoane adulte din Republica Moldova, care au cel puțin un copil cu vârsta de 3 ani. Studiul calitativ a presupus 4 ședințe de focus-grup, cu diferite categorii de participanți (medici de familie, pediatri, părinți) și un interviu în profunzime – cu un reprezentant al Ministerului Sănătății.*

Rezultate. *Au fost reflectate aspecte privind identificarea barierelor și a oportunităților de dezvoltare a competențelor părinților, în procesul de diversificare a alimentației copiilor până la 3 ani și evaluarea cunoștințelor, atitudinilor și practicilor acestora.*

Concluzii. *Deși la etapa actuală este studiată și argumentată corectitudinea alimentației copilului de la 0 la3 ani, există dificultăți de aplicare practică a procesului de diversificare, condiționat de: informarea defectuoasă a părinților, lipsa surselor de informare veridice bazate pe dovezi și de starea socio-economică precară existentă la momentul actual în țară.*

INTRODUCTION

Globally, in 2020 an estimated 149 million children under 5 were stunted (too short for age), 45 million were underweight (low weight for height) and 38.9 million were overweight or obese (1). Every year, 2.7 million child deaths are associated with malnutrition and about 45% of all deaths involve children (2). More than 3.4 million children under the age of 5 die each year due to inadequate feeding practices. Two-thirds of these deaths are associated with inadequate feeding practices in the first 2 years of life (3). These 24 months of a child's life are particularly important because optimal nutrition during this period decreases morbidity and mortality, reduces the risk of chronic diseases and promotes better development (1). Around 6 months of age, the infant's energy and nutrient needs begin to exceed what is provided by breast milk, and complementary feeding becomes necessary to meet the energy and nutrient needs (4). If complementary foods are not introduced at this age or if they are not administered properly, there are disturbances in the growth of the infant (5). Children from poor families are four times more likely to be stunted growing up due to chronic insufficiency of basic nutrients. Children from wealthy families are twice as likely to be overweight (6). It should be emphasized that children bear the consequences of poor nutrition and improper eating practices for the rest of their lives (6). The biggest temptations of early childhood, with the initiation of the process of food diversification in children, are sweets. It is important to select healthy sweets, prepared at home such as: rice with milk, fruit compotes. According to recommendations provided by the American Heart Association (AHA), children should not be given sweets for the first 3 years of life (7).

In the Republic of Moldova, which is a developing country, nutritional practices remain unsatisfactory. According to the Multiple Indicator Cluster Surveys (MICS) only 27% of children eat meat or fish daily and less than 2/3 consume milk daily, 6% are stunted or too short for their age, 2% are underweight (low weight for height), 2% have a low weight for age and 5% of children are overweight (high weight for height) (8).

Adequate dietary behavior during childhood prevents or delays the onset of certain diseases in adulthood, such as coronary heart disease, hypertension, type 2 diabetes, some forms of cancer, etc. Also, a healthy diet contributes to preventing the occurrence and development of nutritional disorders such as iron deficiency and anemia, vitamin D deficiency and rickets, intestinal motility disorders, malnutrition, dental caries (9). The knowledge, attitudes and practices of parents regarding the process of diversifying the child's diet in early childhood play an important role in the adoption of healthy habits, which will be practiced throughout life favoring the maintenance of good health.

Aim of study: assessment of parent's knowledge, attitudes and practices regarding food diversification for children under 3 years old, in order to develop recommendations that would contribute to improving the child's nutrition.

MATERIAL AND METHODS

Type of study: mixed. The quantitative part – descriptive, selective study with the application of a questionnaire developed in the interests of the study. Study sample: 423 adults from the Republic of Moldova, in the reproductive period (18-50 years), who have at least one child under 3 years of age. The qualitative part involved conducting a descriptive study, based on a focus group and an in-depth interview. Four focus group sessions were organized with different categories of participants (family doctors, pediatricians, parents). The in-depth interview – a representative of the Ministry of Health. The data was collected between January and April 2022.

Research methods: historical, statistical, comparative, analytical, graphical.

RESULTS

In the knowledge assessment section, 46% of parents confirmed that they do not know the definition of diversification, the recommended age for the initiation of diversification and the frequency of introducing new foods per week. In compromise with the fact that the majority of respondents know about the risks that can occur in case of incorrect diversification in children, 56% know about obesity, 45% about malnutrition, but 3% state that there are no risks in case of incorrect diversification, and 16% in general do not know what they are. Regarding the respondents' attitude towards exclusive breastfeeding in the first

6 months of life, 99% answered affirmatively, but the research shows that in practice 8% of those questioned introduce foods before 6 months (fig. 1).

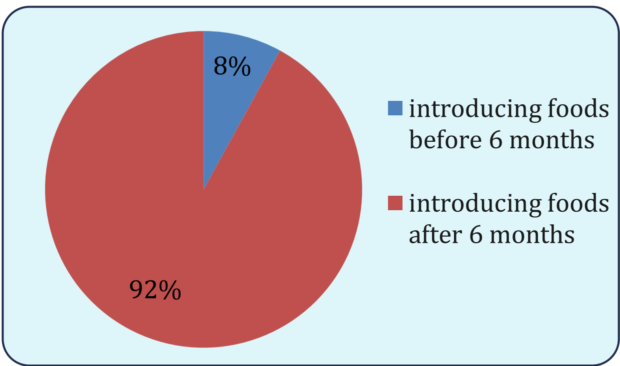

Figure 1. Correlation in respondents' feeding practices before and after 6 months.

According to the research results, 94% know that candies are unhealthy products, but the practice of the respondents shows that 58% of them introduce sweets up to the age of 3, and the frequency of administering sweets is 2-3 times a week in 16% of cases and once a week in 26% of cases.

With reference to the actors involved in diversification, the survey showed that only 26% of respondents stated that the other parent participates in this process. With a much smaller percentage (12%) the family doctor is involved, followed by the district nurse (5%), which indicates a minor consultative involvement of competent staff in the field of diversification.

The difficulties identified in diversification were conditioned in 42% of cases by the attitude of the child who refuses the proposed foods, 20% cited the lack of information sources, and in 21% of cases by the poor financial situation of the interviewed subjects who considered the diversification process to be costly (fig. 2).

There are reservations regarding the information sources: social media and the internet are at the top of the information sources list, preferred by 55% of parents, while only 33% seek advice from medical staff, from whom they could receive more accurate information (fig. 3).

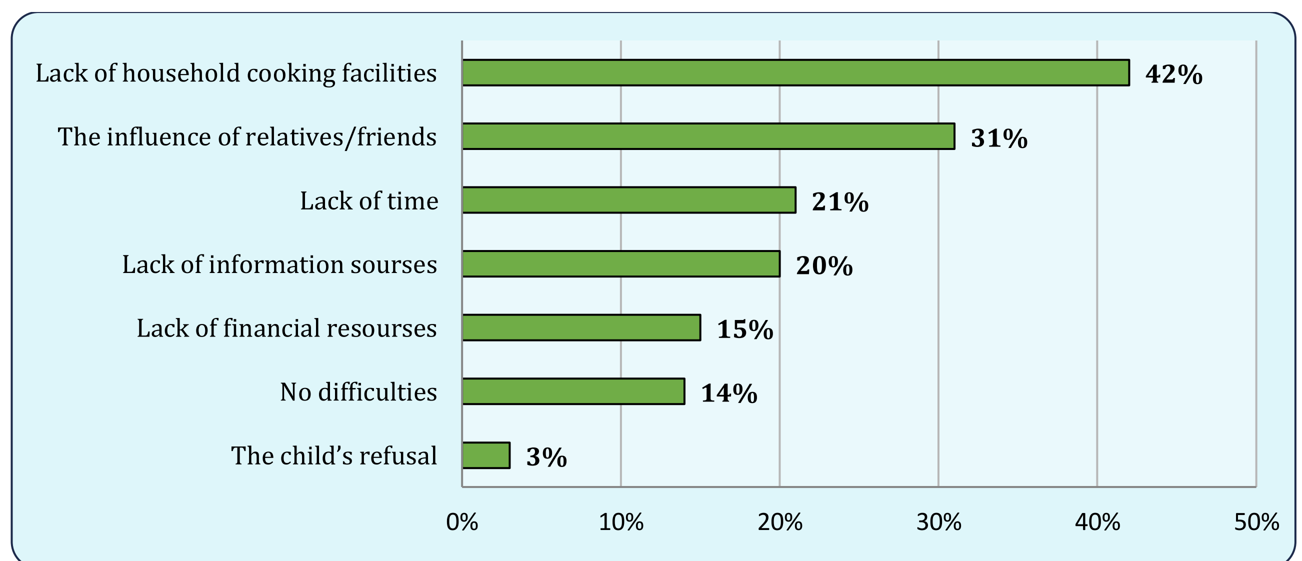

Figure 2. Difficulties/challenges in diversification.

Analyzing the results obtained from conducting focus groups among both doctors and parents, several aspects that make diversification difficult have been identified, namely:

1. The precarious socio-economic situation, which directly affects the quality of the diversification process.
2. Insufficient involvement of medical staff. Doctors have mentioned that parents do not seek their advice, while on the other hand, parents state that medical staff do not have enough time during the consultation to provide quality information about diversification.
3. Differences in diversification based on urban/rural living conditions. Thus, people living in rural areas have greater access to fruits vegetables, organic products, while those in urban areas typically purchase the ingredients

for preparing the necessary foods in the diversification process or administer food from jars intended for children.

4. Information related to diversification is uncertain and is based on subjective sources of information from neighbors, relatives, grandparents, or from social media/internet. And information from official, reliable sources is considered a major gap.

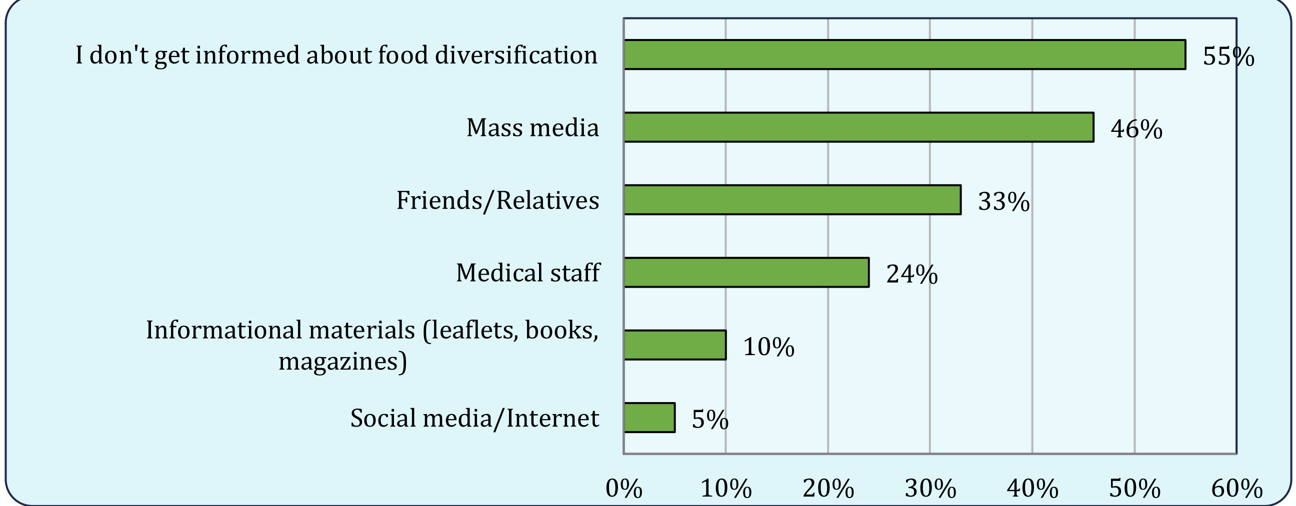

Figure 3. Sources of information in the food diversification process.

The in-depth interview was conducted by interviewing a civil servant from the Ministry of Health of the Republic of Moldova. Aspects related to practices in the field of food diversification for children up to 3 years of age were discussed. The interviewee spoke about the prospects for improving the situation in the field of food diversification for children up to 3 years old, noting that the given process depends on all the factors in society, starting with the family and continuing with healthcare workers, local public administration, social assistance, industrial producers, even agricultural producers – to have healthy food brought to children, both quantitatively and qualitatively. In this aspect, the importance at the national level of a correct approach to the diversification of children's nutrition is emphasized, in order to contribute to the health literacy of the population.

DISCUSSIONS

Although the importance of proper nutrition for children aged 0-3 is studied and supported by evidence, there are difficulties in the practical application of the food diversification process, conditioned by inadequate information provided to parents and the poor socio-economic conditions that currently exist in the country.

The study showed that half of the respondents make errors in the frequency of introducing new foods per week, even though they know the risks of improper diversification.

One of the causes that lead to health risks for children is the practices of parents in offering products that contain sugar and adding salt to foods prepared for children under 3 years old.

There is a need for more active involvement of medical staff in the process of diversifying the nutrition of children under 3 years old, as the study showed that only 12% of family doctors and 10% of paediatricians are involved in this process.

Recommendations of international health organizations regarding the proper implementation of food diversification for children under 3 years old are not being followed and applied in practice by parents, which hinders the prevention and treatment of malnutrition, psychosomatic and motor morbidity, and early childhood mortality.

CONCLUSIONS

1. The level of knowledge among parents regarding the food diversification process for children under 3 years old is low, with 46% of respondents not knowing the information about the recommended

age for breastfeeding, the recommended age for starting the diversification, and the frequency of introducing new foods per week.

2. The lack of financial resources and access to reliable evidence-based information have been identified as the biggest challenges in the weaning process. Social media are the main source of information for parents regarding food diversification process for children under 3 years old (55%), while only 33% receive information from medical professionals.

3. To improve the nutrition of children up to the age of 3, a set of measures is needed aimed at informing parents and offering support in adopting certain attitudes and practices, which would reduce the risks to the child's health and development. In developing and implementing these measures, a range of stakeholder needs to be involved: the Government of the Republic of Moldova, non-governmental organizations, the Ministry of Health, local public authorities, healthcare workers, and, last but not least, parents.

CONFLICT OF INTEREST

There are no conflicts of interest.

ETHICAL APPROVAL

The article does not have ethical approval.

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REFERENCES

1. World health organization. Infant and young child feeding. Available from: https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding [Accessed 26.03.2022].
2. Alvisi P, et al. Recommendations on complementary feeding for healthy, full-term infants. *Italian Journal of Pediatrics.* 2015;41:36. doi:10.1186/s13052-015-0143-5
3. UNICEF. Nutrition Improving Child. The achievable imperative for global progress. Available from: https://data.unicef.org/resources/improving-child-nutrition-the-achievable-imperative-for-global-progress/ [Accessed 26.02.2022].
4. Dewey K, Brown K. Update on the technical aspects of complementary feeding for young children in developing countries and the implications for intervention programs. *Food and Nutrition Bulletin.* 2003;24:5-28. doi:10.1177/156482650302400102
5. UNICEF. Fed to Fail: The crisis of children's diets in early life. Available from: https://data.unicef.org/resources/fed-to-fail-2021-child-nutrition-report/ [Accessed 13.01.2022].
6. Croitoru C, Ciobanu E. Ghid de bune practici: Alimentaţie raţională, siguranţa alimentelor şi schimbarea comportamentului alimentar [Good practice guide: Rational nutrition, food safety and changing eating behavior]. 2019. Available from: http://hdl.handle.net/20.500.12710/6742 [Accessed 05.01.2022].
7. Tahangnacca M, Ridwan A, Ansariadi, Syam A. Contributing factors of stunted growth among toddlers in Makassar city: A qualitative Study. *Journal of Health and Translational Medicine.* 2022;23:189-195. Available from: https://jummec.um.edu.my/index.php/jummec/article/view/25853/12130 [Accessed 10.01.2022].
8. Raportul Ministerului Sănătății, Republica Moldova. Studiul de Indicatori Multipli în Cuiburi [Report of the Ministry of Health, Republic of Moldova. The Study of Multiple Indicators in Nests]. Available from: https://cnpdc.gov.md/sites/default/files/document/attachments/2012_moldova_mics_final_ro.compressed.pdf [Accessed 05.01.2022].
9. Fedorciucova S. Researches in regards of the "alpha" generation nutrition. *Conferința Științifică Internațională „Strategii și politici de management în economia contemporană". Ediția a VI. Chișinău, 26-27 martie 2021*. Available from: https://ibn.idsi.md/vizualizare_articol/134985 [Accessed 11.01.2022].

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Oleg LOZAN, SCOPUS ID: 57211988601

MEDICAL SCIENCES

KNOWLEDGE, ATTITUDES, AND PRACTICES OF PARENTS REGARDING THE USE OF ELECTRONIC DEVICES BY PRESCHOOLERS

Nadejda FARIMA, Alina TIMOTIN, Oleg LOZAN

School of Public Health Management, Chisinau, the Republic of Moldova
Nicolae Testemitanu State Univerity of Medicine and Pharmacy, the Republic of Moldova

Corresponding author: Nadejda Farima, e-mail: nadiacotofan@gmail.com

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Keywords: *preschoolers, electronic devices, gadget, parents, knowledge, attitudes, practices.*

Introduction. *International practices show that electronic devices have a major negative impact on children's development, yet they are widely used. An essential role here belongs to the knowledge, attitudes and practices of parents, as they have a primary role in educating children.*

Material and methods. *A quantitative study was carried out that involved the surveying 422 parents of preschoolers.*

Results. *The research found that among preschoolers, 90% use electronic devices, and 49% own their own device. More than 50% of parents are not aware of recommendations regarding the use of gadgets. Although 92% of parents believe that the use of devices can cause health problems for children, only 29% of children follow the recommendations regarding the duration of device usage. Moreover, over 20% of parents consider devices important for the harmonious development of their child.*

Conclusions. *The level of parents' knowledge regarding the use of gadgets by preschoolers is low, which results in a favorable attitude towards the use of devices by children, leading to their excessive use among preschoolers, without taking into account the recommendations of specialists.*

Cuvinte cheie: *preşcolari, dispozitive electronice, gadget, părinți, cunoștințe, atitudini, practici.*

CUNOȘTINȚE, ATITUDINI ȘI PRACTICI ALE PĂRINȚILOR REFERITOR LA UTILIZAREA DISPOZITIVELOR ELECTRONICE DE CĂTRE PREȘCOLARI

Introducere. *Practicile internaționale demonstrează că dispozitivele electronice au un impact negativ major asupra dezvoltării copiilor, cu toate acestea ele continuă a fi pe larg utilizate. Un rol esențial în contracararea acestui fenomen reprobabil le revine părinților, nivelului lor de cunoștințe, atitudini și practici, ei având un rol primordial în educarea copiilor.*

Material și metode. *S-a realizat un studiu mixt. Au fost organizate 4 ședințe de focus-grup cu educatori și medici, 1 interviu în profunzime cu reprezentantul Ministerului Educației și Cercetării. Studiul cantitativ - chestionarea a 422 de părinți de preșcolari.*

Rezultate. *Rezultatele studiului calitativ au servit la formularea a 9 concluzii, o parte dintre ele au fost folosite ca ipoteze de lucru pentru studiu cantitativ. Cercetarea a relevat că, în rândul copiilor preșcolari, 90 % folosesc dispozitivele electronice, 49 % dețin un dispozitiv propriu. Mai mult de 50% dintre părinți nu cunosc recomandările privind utilizarea gadgeturilor. Deși 92 % dintre părinți consideră că utilizarea dispozitivelor poate cauza copiilor probleme de sănătate, doar 29 % dintre copii respectă recomandările privind durata de utilizare a dispozitivelor. Totodată, peste 20 % dintre părinți consideră dispozitivele importante pentru dezvoltarea armonioasă a copilului.*

Concluzii. *Nivelul de cunoștințe al părinților privind utilizarea de către preșcolari a gadgeturilor este unul scăzut, ceea ce determină o atitudine favorabilă vizând problema în discuție. În consecință, se atestă utilizarea excesivă a gadgeturilor în rândul preșcolarilor, ignorându-se recomandările specialiștilor.*

INTRODUCTION

According to a study by authors Khiu A. and Hamzah H. on the use of devices by young children and preschoolers, 96.6% of children have used mobile devices starting at ages 1 and 2, with the majority using them daily (1), and by the age of 4, many already have their own cell phone (2). Studies in the United States show that 1 in 3 children can use a gadget before they even start speaking (3). In the Netherlands, 98.7% of young people aged 12 to 15 have a smartphone, 91.7% have a laptop, 78.1% have a tablet, and 58.5% have a video game console (4). According to a survey conducted by Coman L. in 2018 among parents in our country, aimed at identifying the interaction of preschool children with modern technologies and the socialization problems that arise in these children, approximately 40% of 4-6 year olds have their own personal device (5).

According to the Centers for Disease Control and Prevention (CDC) in the US, children from 0 to 18 years old spend an average of 8 hours a day in front of a screen (6), which would mean that all the time the child spends outside of school is spent in front of a device. According to reports from UNICEF, daily use of electronic devices among children aged 2-5, even for less than 1 hour a day, leads to a socio-emotional development of the child that is 0.4 times lower than age norms (7). There are also studies that demonstrate a connection between the use of devices and developmental deficiencies in children, including cognitive, language, and socio-emotional development (8). Additionally, these children are more susceptible to obesity, vision problems, anxiety, and depression.

In 2016, the American Academy of Pediatrics formulated recommendations regarding the use of gadgets by children, primarily aimed at parents. Thus, for preschool children, it is recommended to limit screen time to less than 1 hour per day, media content should be of high quality, and parents should view and explain content with the child to help them understand and apply what they see to the real world (7).

The use of devices by preschool children is influenced by a series of factors, including cultural, social, demographic, and personal factors (8, 9). These include place of residence, number of family members, number of children in the family, and the family's financial situation. The COVID-19 pandemic has also influenced the use of devices among children: studies show that 92% of parents reported an increase in the duration and frequency of their children's device use during the pandemic (10). Parental control over device use is necessary to protect children from addiction and other negative consequences (11). Devices can also be useful, but it is crucial how parents introduce their child to the device. Careful monitoring by parents of the media content viewed by their child would have a positive impact on the child's health. Additionally, parents play a role model in device use (children adopt the habits of those around them), so the impact of devices on children's development will depend on the level of knowledge, attitude, and practices of parents.

The aim of the study: Assessing the knowledge, attitudes, and practices of parents regarding the use of electronic devices by preschool children in order to develop recommendations for measures that would contribute to preventing the negative effects caused by their improper use.

MATERIAL AND METHODS

A quantitative study was conducted by applying a questionnaire developed for the purpose of the study. The questionnaire questions were formulated based on international recommendations regarding children's use of gadgets and based on hypotheses obtained in a qualitative study that preceded the quantitative study. The questionnaire was pretested online with a sample of 15 people, and some technical adjustments were made afterwards.

The study sample consisted of 422 adult individuals of reproductive age, who have children aged between 3 and 6 years, from all over the territory of the Republic of Moldova. The inclusion criteria were: age over 18, individuals who gave verbal consent to the study. Exclusion criteria were: age under 18, if one of the parents had already participated in the study, and refusal to participate in the study. The given sample is representative of the population of the Republic of Moldova.

The data was collected between December 2021 and April 2022.

The methods used: historical, statistical, sociological, comparative, analytical and graphical.

RESULTS

In the study, 422 respondents participated, 87% of whom were female and 13% were male. In terms of living environment, 49% were from rural areas and 51% were from urban areas. Of the 422 respondents, 30% had monthly family incomes between 5,000 and 10,000 lei, 27% had incomes below 5,000 lei, 22% chose the *"I don't want to answer"* option, 11% of respondents had an income between 10,000 and 15,000 lei, and 10% had an income greater than 15,000 lei. According to the total number of children, 50% of respondents had 2 children, 22% had one child, 21% had 3 children, while 8% had more than 3 children. The age of the oldest child in the 3-6 year category: 36% were 6 years old, 25% were 5 years old, 21% were 4 years old, and 18% were 3 years old (tab. 1).

Out of the total of 422 respondents, 51% indicated that their children do not own their own device, but use family devices, while 49% of children own their own device.

In rural areas, children have 10% more access to a television and 3% more access to a high-end phone compared to their urban counterparts, while preschoolers in urban areas have access to video game consoles and smart watches (fig. 1). Therefore, we can say that in urban areas, children have access to a wider range of electronic devices.

Table 1. Sample structure.

Respondents' living environment	**Urban**		**Rural**	
	51%		**49%**	
Gender	male		female	
	13%		87%	
Age category	18-25 years old	26-35 years old	36-45 years old	over 45 years old
	9%	63%	26%	2%
Level of education	primary	secondary education	high school studies	higher education
	5%	19%	23%	52%
Occupation	employed	unemployed	entrepreneurs	students
	59%	36%	5%	1%
Total number of children	1 child	2 children	3 children	more than 3 children
	22%	50%	21%	8%
Number of children aged 3-6 years old	1 child	2 children	3 children and more	
	70%	27%	4%	
Gender of the child	male		female	
	52%		48%	
The age of the oldest child in the 3-6 year category	3 years old	4 years old	5 years old	6 years old
	18%	21%	25%	36%

Among parents, 78% believe that the frequency and duration of device use has increased during the COVID-19 pandemic. In addition, compared to 2020, there is also an increase in the rate of 4-6 year old children who own their own device in 2022. This increase is most likely due to the influence of the COVID-19 pandemic, as well as the increased access to electronic devices for children.

Among preschool children, 90% use electronic devices, with minor differences depending on the living environment, namely: in urban areas, 88% use electronic devices, while in rural areas – 92%. In focus groups, there were hypotheses that this difference is due to the fact that preschoolers in urban areas are involved in activities outside of kindergarten and that in urban areas there is infrastructure that allows for outdoor recreation activities.

Only 29% of children comply with the recommendations regarding the duration of device use, and

8 % of children use devices for more than 3 hours a day (especially television) (tab. 2), which would mean that the child spends almost all of their time outside of kindergarten hours with a device.

A limitation of this analysis is represented by the fact that the estimations were made for each device separately, assuming that a child uses only one device. If we were to analyze the cumulative time for all devices, the situation could be much more alarming. This aspect may be the subject of further research.

Among the most popular activities that children do with the help of gadgets are watching movies, cartoons, videos, playing video games, and listening to music. Children in urban areas practice playing video games twice as much as those in rural areas, and this is also explained by the fact that, unlike their peers in rural areas, children in urban areas have access to video game consoles.

More than 50% of parents do not know the recommendations regarding the appropriate age and duration of device use (fig. 2). Although 57% of parents are aware of the sleep disturbances that may occur in children as a result of excessive device use before bedtime, only 27% of children aged 3-6 never use a device before sleep.

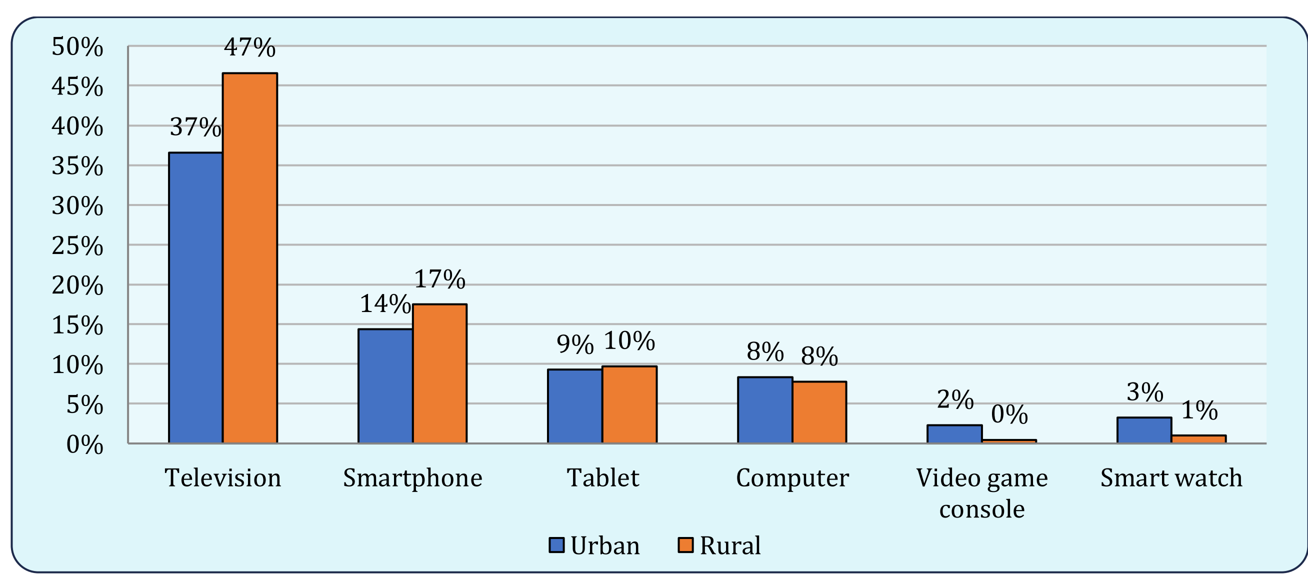

Figure 1. Distribution of devices owned by preschoolers, according to the place of residence.

Table 2. The share of device usage time by preschoolers, (in %).

N/0	Device type	Up to 1 hour/day	Up to 2 hours/day	Up to 3 hours/ day	More than 3 hours/ day	Does not use/have a device
1	**Smarthphone**	34.60	20.38	9.24	4.74	31.04
2	**Computer**	23.93	10.19	2.61	2.37	60.90
3	**Television**	28.67	30.81	22.04	15.40	3.08
	Media	**29.07**	**20.46**	**11.30**	**7.50**	**31.67**
	STDEV (standard deviation)	**5.34**	**10.31**	**9.88**	**6.94**	**28.92**

Parents' knowledge about the use of electronic devices by preschoolers varies according to their age and level of education. Thus, parents over the age of 45 know less about recommended durations and ages for the use of electronic devices by preschoolers, while those with a higher level of education know more. Parents' knowledge does not vary depending on their living environment.

The results show that 50% of parents gather information from the internet, followed by educators at 26%, and family doctors at 16%, highlighting the need to develop the competencies of these specialists in the field. It should be noted that 19% indicated that they have not received such infor-

information, and 8% indicated that they do not need it. Parents in urban areas gather information from the internet 13% more than those in rural areas, while those in rural areas gather information from educators 7% more than those in urban areas.

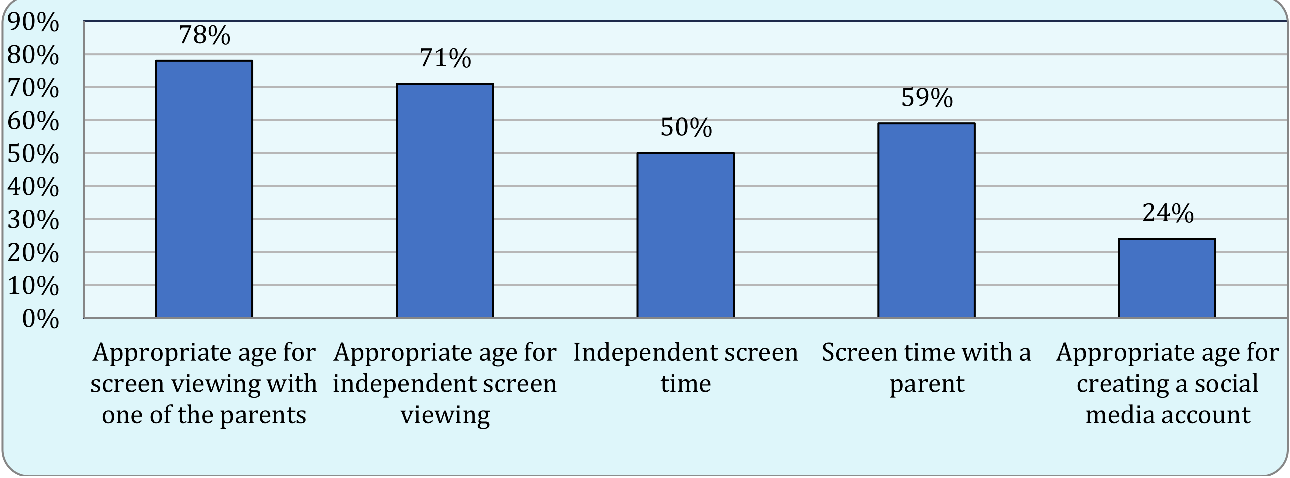

Figure 2. The proportion of incorrect answers according to the questions asked to parents.

Although 92% of parents believe that the use of electronic devices can cause health problems in children, parents are only aware of a few of the consequences of excessive use, namely: more of them are aware of vision disorders, while fewer are aware of obesity and anxiety. Nevertheless, parents have positive attitudes towards electronic devices. Thus, 26% of parents believe that devices contribute to the harmonious development of the child, 17% believe that they have a beneficial effect on the child, and 20% believe that devices help the child learn to read, write, and speak. It is alarming that 5% of parents believe that a child should create a social media account by the age of 6.

The most frequent reasons why parents give electronic devices to their children are: lack of time to give them attention (29%) and the desire to calm the child (15%). In 75% of cases, parents prefer to prohibit the use of devices, while only 35% use parental control applications. From the study, we observe that only 1% of children who are prohibited from using devices before sleep *always* use them before sleep, compared to 22% of children who are not prohibited. The same trend is observed when analyzing the use of devices during meals. Thus, only 1% of children who are prohibited from using devices during meals *always* use them, while 13% of those who are not prohibited do. This demonstrates the effect of parental prohibitions on the behavior of the child.

Although parents are aware of certain recommendations, it does not necessarily mean that they will follow them. Supporting this idea are the data regarding the consequences of device use. Of the 57% of parents who are aware of sleep disturbances caused by gadget use, only 31% prohibit the use of devices before bedtime. At the same time, analyzing the responses of parents in the *Knowledge* section, we see that 55% of parents are aware of the recommended duration of device use, but regarding their practices – only 47% of all parents adhere to this duration.

DISCUSSIONS

The comparative results of the data obtained in this study with a study by the author Coman L., conducted in 2018, show that in recent years the rate of preschool children who have their own device has increased from 40% to 49%.

The widespread use of devices among preschoolers is determined by parents' low level of knowledge in this area. Moreover, even if parents are aware of certain recommendations, it does not necessarily mean that they will follow them, as the number of those who are aware is always greater than those who use this knowledge in practice. Although 57% of parents are aware of the sleep disturbances that may occur in children as a result of excessive use of devices before bedtime, only 27% of children aged 3-6 never use a device before bedtime.

Parents prefer to ban the use of devices rather than control their child's interaction with the device using parental control applications. The more parents ban the use of gadgets, the less children use them, compared to children who are not prohibited from using gadgets.

Parents' knowledge, attitudes and practices differ depending on a number of factors including parents' living environment, age and education. These results were also obtained in a UNICEF study on the factors influencing the use of gadgets by children (7).

CONCLUSIONS

1. According to the research results, we found that parents' level of knowledge regarding the use of electronic devices by preschoolers is low, with more than half of the parents not knowing the general aspects related to gadget use.
2. Parents have different attitudes regarding the use of devices, with the majority believing that device use can cause health problems for their children, but at the same time, a significant portion of parents view gadgets as a necessary tool that helps children develop. Most parents believe that during the COVID-19 pandemic, the frequency and duration of device use have increased.
3. Among preschool children in the Republic of Moldova, 90% use gadgets, and almost half of them have their own device, most commonly a television. Parents allow preschoolers to watch screens for longer than the recommended durations by specialists, with some preschoolers using them for even more than 3 hours per day. Among the most popular activities carried out by children using gadgets are: watching movies, cartoons, videos, playing video games, and listening to music.
4. To reduce the negative impact of electronic device use, a set of measures is needed aimed at improving parental knowledge, influencing attitudes, raising awareness among parents to perceive the risks of excessive use of electronic devices, and changing parental practices regarding the use of electronic devices by preschool children.
5. The development and implementation of such measures require the involvement of various actors, such as central and local public authorities, subordinate institutions, non-governmental organizations, society, and last but not least, parents.

CONFLICT OF INTEREST

There are no conflicts of interest.

ETHICAL APPROVAL

The article does not have ethical approval.

FUNDING STATEMENT

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REFERENCES

1. Khiu A, Hamzah H. Exploratory analysis of pilot data: trends of gadget use and psychosocial adjustment in pre-schoolers". *International Journal of Early Childhood Education Care.* 2018;7. doi:org/10.37134/saecj.vol7.2.2018
2. Agustin RP, et al. The Relationship Between the Use of Gadget and Emotional Development of Preschool Children. *Malaysian Journal of Nursing.* 2019;11(02):97-102. doi:10.31674/mjn.2019.v11i02.011
3. Sundus M. The Impact of using Gadgets on Children. *Journal of Depression and Anxiety.* 2017;7(1):1-3. doi:10.4172/2167-1044.1000296
4. Geurts SM, Koning I, Vossen H, Van den Eijnden R. A Qualitative Study on Children's Digital Media Use and Parents' Self-interest. *J. Child Fam. Stud.* 2021. doi:10.1007%2Fs10826-021-02074-3
5. Coman L. Problema socializării copiilor preşcolari şi interacţiunea lor cu tehnologiile moderne [The problem of preschool children's socialization and their interaction with modern technologies]. *Institutul de Ştiinţe ale Educaţiei.* Available from: https://ibn.idsi.md/vizualizare_articol/115399 [Accessed 24.04.2021].
6. Fitriahadi E, Tyastiti VH. The impacts of the use of gadgets on the development of chil-

3-6 years of age. *Southeast Asian Journal of Midwifery.* 2020;6(1). doi:10.36749/seajom. v6i1.83
7. UNICEF. Education Policy and Research Association. Gadget playing and TV watching habits in children aged 2-5: antecedents and effects. Available from: https://www.unicef.org/georgia/reports/gadget-playing-and-tv-watching-habits-children-aged-2-5-antecedents-and-effectsoutcomes [Accessed 14.12.2021].
8. Dinleyici M, Carman KB, Ozturk E, Sahin-Dagli F. Media Use by Children, and Parents' Views on Children's Media Usage. *Interactive Journal of Medical Reserch.* 2016;5(2):18. doi:10.2196/ijmr.5668
9. Mahbubur R. et al. Prevalence and impact of the use of electronic gadgets on the health of children in secondary schools in Bangladesh: A cross-sectional study. *Health Science Reports.* 2021;4(4). doi:10.1002/hsr2.388
10. Khan S, Qutoshi SB. Use of Technological Gadget and its Effects on Children at Agah Walidain Program and Beyond during Covid-19 Pandemic Lockdown. *International Review of Social Sciences*. 2021;9(2):22-32. Available from: https://www.researchgate.net/publication/350487605 [Accessed 11.01.2022].
11. Pertiwi L, Prakosa F. The Use of Technology in the Cognitive Development of Early Children. *I-Statatement.* 2021;6(1): 49-54.

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FACTORS DETERMINING ON-DEMAND ABORTION DECISION-MAKING IN WOMEN

Viorelia GROSU[1], Corina Cardaniuc[2,3], Adriana PALADI[2,4]

[1]*Gheorghe Paladi* Municipal Clinical Hospital, Chisinau, the Republic of Moldova
[2]*Nicolae Testemitanu* State Univerity of Medicine and Pharmacy, the Republic of Moldova
[3]Medpark Maternity Hospital, Chisinau, the Republic of Moldova
[4]School of Public Health Management, State Univerity of Medicine and Pharmacy, the Republic of Moldova

Corresponding author: Viorelia Grosu, e-mail: viorelia.grosu@gmail.com

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Keywords: *abortion on demand, determinant factors, unwanted pregnancy, psychosocial support.*

Introduction. *Abortion causes problems in reproductive health, relationships in a couple, psychological and social consequences. A woman's decision to have an abortion depends on many factors, whereas in low-income countries, abortion is viewed as a method of family planning.*

Material and methods. *A descriptive, quantitative and qualitative sample study was conducted in the Republic of Moldova from December 2021 to February 2022 to identify and evaluate the factors influencing a woman's decision-making to terminate a pregnancy, as well as to develop recommendations for reducing the number of abortions on demand. The quantitative assessment included a survey carried out on a sample of 399 women who underwent abortions on demand. The qualitative study involved three focus group meetings, where the obstetrician-gynecologists shared their ideas upon the factors determining a woman's decision to terminate a pregnancy.*

Results. *Analyzing the data obtained, the present research identified the following factors that determined the decision-making of women to terminate a pregnancy: (i) lack of support and disturbed psycho-emotional state in women; (ii) social and economic problems, particularly, poverty; (iii) study/career-related conditions; (iv) age; e) difficult relationship with the partner, particularly, domestic violence; (v) fear of COVID-19 infection.*

Conclusions. *Women's reasons for seeking abortions are complex, traced out by circumstantial and systemic realities.*

Cuvinte cheie: *avort la solicitare, factori determinanți, sarcină nedorită, suport psiho-social.*

FACTORII DETERMINANȚI ÎN DECIZIA FEMEII PRIVIND ÎNTRERUPEREA SARCINII LA SOLICITARE

Introducere. *Avortul determină probleme în sănătatea reproductivă, în relațiile de cuplu, consecințe psihologice și sociale, constituind un argument temeinic de a reduce numărul acestora. Decizia femeii de a avorta implică diverşi factori, iar în statele cu venituri reduse avortul este perceput ca o metodă de planificare a familiei.*

Material și metode. *Pentru a identifica și a evalua factorii ce influențează decizia femeii de a întrerupe sarcina; pentru a elabora recomandări privind reducerea avorturilor la solicitare în Republica Moldova a fost efectuat un studiu selectiv descriptiv, cantitativ și calitativ, în perioada decembrie, 2021 – februarie, 2022. Componenta cantitativă a implicat chestionarea unui eșantion de 399 de femei care au avortat la cerere. Componenta calitativă a constat în organizarea a trei ședințe de focus grup cu medici obstetricieni-ginecologi, unde au fost analizate percepțiile acestora privind factorii care determină decizia femeii să întrerupă sarcina.*

Rezultate. *Analizând datele obținute, am constatat factorii care au determinat decizia femeilor să întrerupă sarcina: a) lipsa susținerii și starea psiho-emoțională a femeii; b) probleme de ordin social-economic, în special – sărăcia; c) circumstanțe legate de studii/carieră; d) vârsta; e) relațiile dificile cu partenerul, în special - violența în familie; f) frica de infecția COVID-19.*

Concluzii. *Motivele femeilor care solicită să avorteze sunt complexe, însă sunt influențate de realitățile circumstanțiale și sistemice.*

INTRODUCTION

Despite the controversial views regarding abortion, which have become stronger in the modern era, it is increasingly promoted as the women's right to decide upon their sexual and reproductive health, being a fundamental pillar of gender equality that cannot be diminished or violated (1). At the same time, the number of on-demand abortions worldwide is by no means negligible. Research by the Guttmacher Institute shows that there are about 73 million abortions worldwide each year, of which about 88% occur in developing countries (2).

One of the commonly stated reasons for abortion is an unplanned pregnancy. For example, studies estimate that of the 121 million unplanned pregnancies reported worldwide between 2015 and 2019, about 61% result in abortion (2). However, there are several steps involved in assessing an unplanned pregnancy prior to undergoing abortion and, in fact, a complex of factors that should determine the decision-making (3). Many women with unplanned pregnancies do not think of abortion. Some of them will adjust to the new pregnancy situation and to the new circumstances. Others may initially want to interrupt pregnancy, but change their mind, either because they were initially hesitant and then changed their mind for their own reasons, or under the influence/insistence of other people (family, friends, etc.).

Several international studies show that the reasons that drive women to have an abortion are often more complex than simply not wanting to have children. Among these reasons, social and economic problems are often stated, such as interruption of education or employment, lack of support from the partner, the desire to provide schooling for already existing children, and poverty, unemployment or financial inability to support and educate a child (3). Relationship problems with the partner (4) and the woman's perception that she is too young to become a mother have also been mentioned (5).

Unfortunately, in the Republic of Moldova, abortion is one of the frequently requested methods of birth control. In 2019, there were 33 abortions per 100 live births (6). Experts note that official data do not disclose the total number of abortions, some of which are carried out at home. About 7,000 on- demand abortions are performed annually across the country (7,041 abortions were carried out in 2019). The number of late pregnancy terminations (before 21 weeks of gestation) performed for medical or social reasons remains high (105 in 2019) (7, 8).

The purpose of this study was to identify and assess the determinant factors influencing women's decision-making to terminate a pregnancy, with the aim of developing recommendations to reduce the number of on-demand abortions in the Republic of Moldova.

MATERIAL AND METHODS

To achieve this goal, a selective descriptive, quantitative and qualitative study was conducted. Several methods were used to collect and process the obtained data, systematize the facts and present them as scientific categories and trends to confirm or refute the hypotheses stated. The historical, sociological, comparative and biostatistical methods were applied within this research. The quantitative study involved 399 pregnant women up to 12 weeks of age, who were interviewed on their decision to follow an abortion within the advisory departments of specialized medical institutions of Cahul, Chisinau and Balti municipalities. The sample size was calculated based on the number of on-demand abortions up to 12 weeks in 2020, which is 4987 cases (N is the size of the general population: women who applied for an abortion up to 12 weeks).

The study included only those women who expressed a desire and voluntary consent to complete the printed questionnaires distributed within the Perinatal Centers of the Republic of Moldova authorized to perform abortions. 450 questionnaires were distributed to a sample of 392 respondents. 450 questionnaires were collected, of which 399 were validated. The questionnaires were used within the Level III Perinatal Center: IMPH Institute of Mother and Child and within three Level II Perinatal Centers, namely, *George Paladi* Municipal Clinical Hospital, Balti Perinatology Center, and Cahul Perinatology Center. The questionnaires were developed by the authors of the study on the basis of the relevant international researches and were tested to define the questions on a small group of respondents, as well as considering the scientific requirements and objectives of the study. The questionnaire consists of 32 questions with main-

ly closed answers, divided into 4 compartments, viz. (i) Socio-demographic data; (ii) Decision-making factors; (iii) Consequences of abortion; (iv) Contraception. Data was collected between December 2021 and February 2022.

The qualitative study included the opinions of obstetrician-gynecologists regarding their own experience and cases from practice, which give ideas about the determining decision-making factors in women who requested abortion. There were 3 focus group (FG) sessions (each 8-12 participants). The study selected doctors providing safe abortion services who expressed their willingness to participate in discussions. The focus group guide focused on several key topics, including questions on factors that determine a woman's decision to terminate a pregnancy; the role of the partner in decision-making; the doctor's role in a woman's decision to have an abortion, women's perceptions or knowledge about the consequences of abortion and contraception, etc. The major purpose of the subsequent analysis was focused mainly not on the respondents, but rather on understanding their attitudes or gaps found. Besides the questions prepared in advance that were included in the interview grid, the interviewees were also encouraged to speak up openly in order to clarify some specific aspects. Study participants were guaranteed complete confidentiality. Incomplete questionnaires were not included in the study.

The obtained data were stored, processed and analyzed using Microsoft Excel and SPSS programs.

The study collected a range of socio-demographic data on the quantitative study sample, such as age, place of residence, occupational status and family composition, etc. Thus, the study involved women aged 20 to 29 years (41.8%); women 30-40 years old (38.8%); women aged 16-19 (10.2%); and women over 41 (9.2%). More than 2/3 of the participants indicated urban environment as place of residence. Regarding the occupational status, most women under study (68.8%) were employed; 12.2% – on parental leave; 13.0% – female students; about 6% were unemployed. In terms of education, 39.8% of participants had higher education; 39.0% – vocational secondary education, high school education – 11.4%; postgraduate studies – 5.8%; secondary education – 4.0%. The proportion of married women was 64.2%; living together – 16.2%; single – 12.3%; those whose marriage ended in divorce or spouse death – 7.3%. The proportion of primigravidas who requested an abortion was 19.3%; about 36.6% already have a child, every third (33.6%) have 2 children, and 10.5% of them have 3 or more children.

Women's attitudes towards abortion. The study found that women from the Republic of Moldova have different perceptions regarding abortion. About 35% of women who applied for abortion fully or partially claimed that every child conceived has the right to be born, about 17.8% agree that a pregnant woman is obliged to give birth, and about 37% consider abortion a crime. Every fourth woman included in the study (24.3%) admitted that it was very difficult for her to decide on an abortion, and the majority of respondents (70.9%) indicated that it was difficult for them to make such a decision. Only a few women (4.8%) admitted that their decision was an easy one. Thus, many women's perception of abortion continues to have a negative connotation that is not accepted but requested for certain reasons.

One of the priority factors influencing the abortion decision-making, mentioned in numerous international studies, is the socioeconomic status of a woman. This reason seems to be true for women from the Republic of Moldova. Thus, even if about 2/3 of women are employed, almost every third woman surveyed (34.3%) indicated poverty and material difficulties in raising a child; and more than a third (37.3%) indicated housing shortage. A large number of women interviewed mentioned as determining factors, the impossibility of leaving the job (44.6%) and the concern that the pregnancy/child will affect their career (40.1%); 9.3% of women stated the impossibility of maintaining pregnancy due to emigration planning (fig. 1).

Moreover, economic problems and poverty were assessed as a priority in a woman's decision to terminate a pregnancy among the focus group. However, other opinions were also mentioned during the discussions. Some physicians argue that a woman's economic profile is irrelevant, and the same determining factors cannot be assessed in the same way. "You can't say that only poor women or only rich women request abortions! It's something completely different!" (FG 3).

Age has also been found as a factor influencing the decision-making on abortion in about 10.3% of the women who participated in the study, particu-

larly in 16-19 age group or in women over 41 years old (fig. 1). Of the arguments given, the young women stated: "I'm too young", "I'm not married", "I should continue my studies". Whereas in over 41 age group "the fear of giving birth to a disabled child" and "I have already few born children" were mentioned. In this context, it is worth mentioning the opinions of gynaecologists from the focus groups, who believe that most women over 41 years old do not dare to give birth due to fear of being stigmatized. "In our society, stereotypes and prejudices are very strong, which make women over 41 feel ashamed to give birth ... they are afraid of what the world will say" (FG 2).

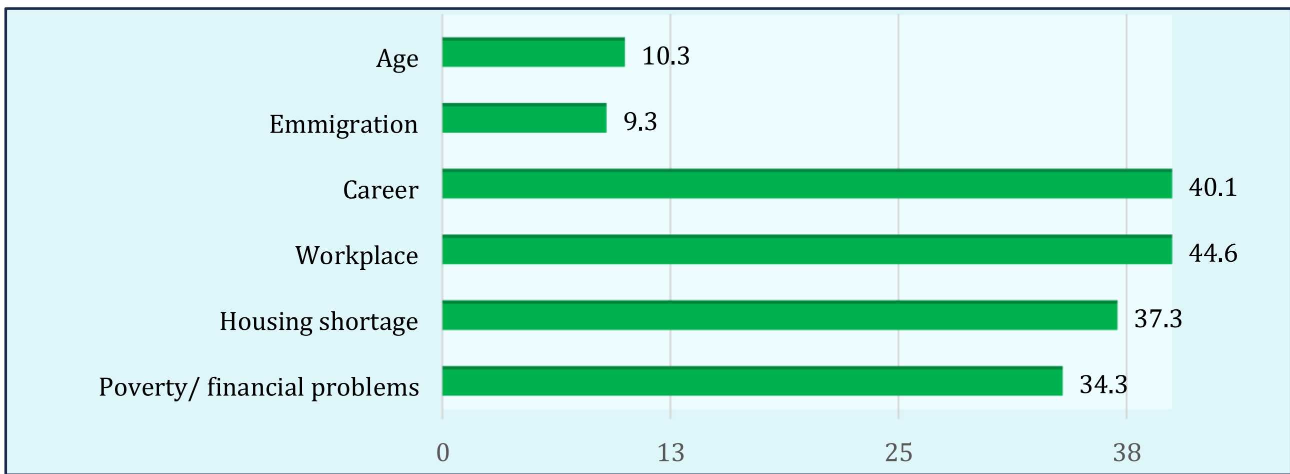

Figure 1. Socio-economic decision-making reasons to terminate a pregnancy, %.

Another assessed factor was the involvement of the partner in the decision to terminate the pregnancy. According to the data, every fourth woman (25.3%) preferred not to tell her partner about her pregnancy. At the same time, in 1.5% of cases the partner had no opinion, leaving the decision to the woman. This is probably due to cultural peculiarity, whereby some men believe that childbearing is entirely the responsibility of the woman.

At the same time, a significant number of women (44.6%) admitted that their partner insisted on an abortion. However, 18.8% of women indicated that their partner insisted on maintaining the pregnancy and was against abortion; nevertheless, they decided to terminate it. In 9.8% cases the death of a partner was recorded. Probably, a psychological counseling would be useful in such cases.

One of the reasons claimed by women in decision-making was domestic partner violence, which was reported in 6% of cases. Women who apply for abortion after being raped is also an alarming factor: the study revealed 4 such cases (1.0%). It should be noted that about 2/3 of women (68.0%) stated that it was an unwanted pregnancy, and among the reasons given (12.0%) was that it came from a wrong man. At the same time, about 1/3 of women indicated that this was a desired pregnancy. Among the factors that influenced the change in the woman's decision were the partner' death, separation, and financial changes.

Physicians who participated in the focus group discussions often emphasized the important role of the partner in a woman's decision to terminate a pregnancy. Some of the relevant opinions stated were as follows: "The role of the partner should not be underestimated! It often makes a big difference!" (FG 2); "The reason for an abortion is often a difficult relationship with a partner – family fights, infidelity, divorce, and violence. Thus, a woman decides to have an abortion even in cases where the pregnancy was initially desired! (FG1); "If there were love and understanding, a woman would not have an abortion, even if she lives in poor conditions" (FG 3).

The study shows that the decision to have an abortion was also significantly influenced by a number of other society actors, even though there is a high percentage of women who made this decision on their own (65.2%), without any support from the others. Thus, every third respondent claimed that different people influenced their decision: parents (13.8%), friends (6.5%), and in unique cases - by the doctor or the village priest.

A factor that may contribute to unwanted pregnancies (which were reported in ⅔ of cases under the study) and, consequently, to requests for abortion, is the availability of contraceptive methods. When being asked to rate the affordability and geographic accessibility of contraceptives, the majority of respondents (60.7%) stated the fact that, in most cases, contraceptives are available whenever they need them; at the same time, every 5th woman indicated that she could afford to buy contraceptives to a lesser extent; and more than 1/3 of women reported that they can only sometimes buy contraceptives. There was also a lack of access to information in more than 80% of women, who admitted that they would like to know more about contraceptive methods. It was an interesting fact found, showing that more than half of the respondents had previously had abortions, of which about 39% women had a second abortion, for 10% that was their third abortion, and 12 women (3%) indicated that they already had had more than 3 abortions before.

Among the reasons influencing the decision to have an abortion were the fears for the health of the unborn child; consumption of harmful substances (alcohol, smoking) was found in 21 women (5.3%); using teratogenic drugs – 44 women (11.0%). One of the aggravating circumstances was the period of the COVID-19 pandemic. Every third woman (34.8%) indicated the fear of the COVID-19 infection as one of the factors that prompted them to have an abortion, and 18.3% of those surveyed indicated that they had had SARS-Cov-2 infection during pregnancy (fig. 2).

During focus group discussions, doctors confirmed that the number of unplanned pregnancies increased during the pandemic.

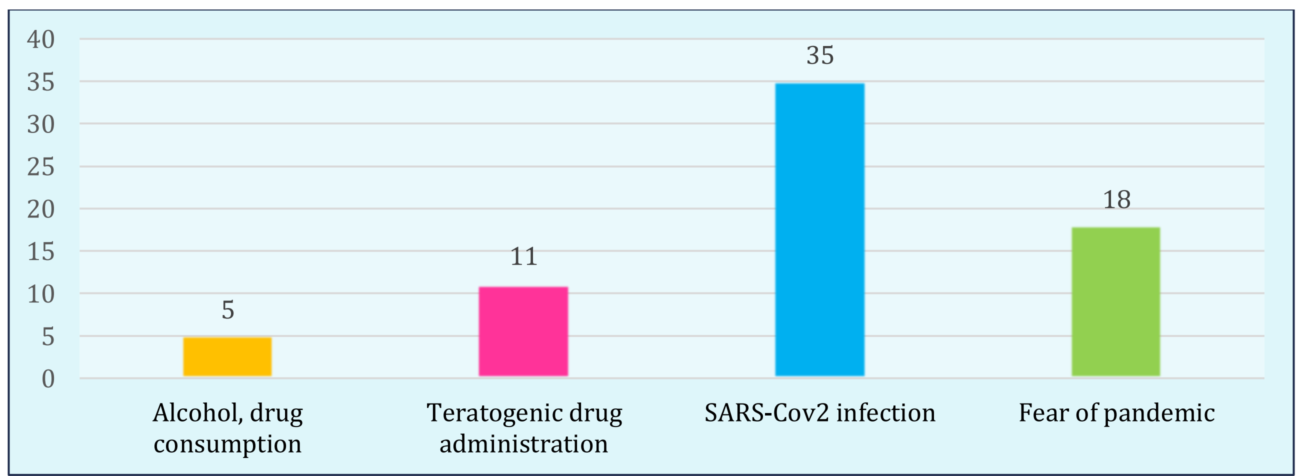

Figure 2. Other important factors in abortion decision-making, %.

DISCUSSONS

The data analysis revealed the fact that married women (64.4%), employed women (70.0%), living in urban areas (78%), those aged 20-40 years old (80.8%), those who have a professional or higher education (80.0%) and who have already given birth to children (79.6%) are among the women who decide to terminate a pregnancy. Among the factors that determined the women from the Republic of Moldova to terminate a pregnancy are the following: (i) lack of support; (ii) socio-economic problems, particularly, poverty; (iii) study/career-related issues; (iv) age; (v) difficult relationship with a partner, particularly, domestic violence; (vi) fear of contracting COVID-19; (vii) substance use (alcohol, tobacco). The partner plays an important role in a woman's decision to have an abortion. Even if the proportion of married women prevails (64.4%), about 44% of respondents did not tell their partner about it. However, in 44.6% of cases, the partner insisted upon having abortion. Based on the fact that ⅔ of the respondents reported that the pregnancy was unwanted, whereas some women had already had three abortions before, we concluded that abortion is mostly perceived as a method of family planning by a significant part of the population. According to the 2018-2022 National Program for Health and Sexual and Reproductive Rights of the Republic of Moldova, Article 20, the state together with the National Health Insurance Company covers 80% of the contraceptive costs for population groups as low-income people, adolescents, HIV-infected people, sexual assault victims (8).

A previous study with comparable objectives and results, conducted at the district level (Cahul district) on a sample of 950 women revealed that common factors that lead women to seek abortion on demand are as follows: socioeconomic status (26%), status of a modern woman (22%), marital status (single/divorced) 19%, unstable relationship with a partner (15%), no desire to have more children 12%) or having already small children in the family (6%). At the same time, it was found that most 19-30 aged women seek for abortion, particularly the married ones (59%). The rate of rural women under the study was higher (63%), and only 50% of respondents had higher education and specialized secondary education. Most of the interviewed women think that abortion is an acceptable way to avoid unwanted childbirth, despite the fact that it may threaten their health. Nevertheless, the World Health Organization (WHO) promotes women's universal access to abortion through quality services and without stigmatization, carried out in accordance with the international standards.

CONCLUSIONS

1. The woman's decision to interrupt a pregnancy is commonly a complex process, combining several factors. Thus, preventive actions should cover several areas, such as education and information, psychological support, financial support, fighting stereotypes and prejudices, access to sexual and reproductive health services, etc.
2. According to the data presented, the partner 'decision, the fear of SARS-CoV-2 infection and the use of teratogenic drugs are paramount in abortion decision-making process.
3. The study showed that women from the Republic of Moldova still find abortion as a method of family planning, given the low level of knowledge regarding sexual and reproductive health in both family planning and contraception, as well as the abortion risks.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICAL APPROVAL

The article did not undergo Ethics Committee approval since it does not contain any ethical risks. The study consists of a survey performed on adults, which adheres to all requirements for data anonymity and maintains the confidentiality of participants.

REFERENCES

1. Bankole A, Singh S, Haas T. Reasons Why Women Have Induced Abortions: Evidence from 27 Countries. *International Family Planning Perspectives*. 1998;24(3):117-127.
2. Brauer M, van Ditzhuijzen J, Boeije H, van Nijnatten J. Understanding Decision-Making and Decision Difficulty in Women With an Unintended Pregnancy in the Netherlands. *Qualitative Health Research*. 2019;29(8):1084-1095. doi:10.1177/1049732318810435
3. Glander SS, Moore ML, Michielutte R, Parsons LH. The Prevalence of Domestic Violence Among Women Seeking Abortion. *Obstetrics & Gynecology*. 1998;91(6):1002-1006. doi:10.1016/s0029-7844(98)00089-1
4. Alan Guttmacher Institute. Unintended Pregnancy and Abortion Worldwide. Fact Sheet. 2020. Available from: https://www.guttmacher.org/fact-sheet/induced-abortion-worldwide [Accessed 10.12.2021].
5. Indicațiile sociale pentru întreruperea voluntară a cursului sarcinii până la sfârșitul săptămânii 21-a de sarcină. Anexa nr. 2 la Standardul privind întreruperea sarcinii în condiții de siguranță. Aprobat prin ordinul MSMPS al RM nr.766 din 18.08.2020 [Social indications for voluntary termination of pregnancy until the end of the 21st week of pregnancy. Appendix no. 2 to the Safe Termination of Pregnancy Standard. Approved by MSMPS order of the Republic of Moldova no. 766 of 18.08.2020]. Available from: https://msmps.gov.md/wp-content/uploads/2020/12/Standardul-privind-%C3%AEntreruperea-sarcinii-%C3%AEn-condi%C8%9Bii-de-siguran%C8%9B%C4%83-aprobat-prin-ordinul-MSMPS-nr.766-din-18.08.2020.docx [Accessed 10.12.2021].
6. Anuar statistic al sistemului de sănătate din Moldova. Anul 2019. Evaluarea sănătății mamei și copilului. MSMPS și ANSP. Chișinău 2020 [Statistical yearbook of the healthcare system in Moldova. Year 2019. Maternal and child health assessment. MSMPS and ANSP. Chisinau 2020]. Available from: www.ansp.md [Accessed 10.12.2021].

7. Întreruperi de sarcină. Banca de date statistice Moldova [Load interruptions. Moldova Statistical Data Bank]. Available from: www.statistica.md [Accessed 10.10.2021].
8. Predrag FM. Raport referitor la situația sănătății sexuale și reproductive și a drepturilor aferente în UE, în contextul sănătății femeilor. Comisia pentru drepturile femeilor și egalitatea de gen. Parlamentul European [Report on the situation of sexual and reproductive health and rights in the EU, in the context of women's health. Commission on Women's Rights and Gender Equality. The European Parliament informs Moldova]. Available from: https://www.europarl.europa.eu/doceo/document/A-9-2021-0169_RO.html#title1 [Accessed 14.12.2021].

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PHARMACISTS' WORKPLACE SAFETY DURING THE COVID-19 PANDEMIC

Svetlana CHIHAI, Mihail PISLA

School of Public Health Management, *Nicolae Testemitanu* State Univerity of Medicine and Pharmacy, the Republic of Moldova

Corresponding author: Svetlana Chihai, e-mail: svetlana.chihay@gmail.com

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Keywords: *pharmacy, pharmaceutical activity, security, workplace, COVID-19 pandemic.*

Introduction. *Pharmacists are likely to be exposed to lower risks in healthcare emergencies compared to health workers from other health sectors (primary care, emergency care or hospitals). This present research has assessed the risks of pharmaceutical workers during the COVID-19 pandemic, as well as analysed the safety measures applied within the workplace in order to present recommendations for the protection of pharmacists and reducing the risk factors.*

Material and methods. *A quantitative and a qualitative study was carried out during the present research. The quantitative study was carried out on a sample of 336 pharmacists and pharmacist assistants from different pharmacies. The qualitative study was based on in-depth interviews with 8 representatives from different areas of the pharmaceutical sector.*

Results. *The study results reflected several aspects regarding the roles of pharmacists, the risks they were subjected to, and the morbidity of pharmacists during the COVID-19 pandemic, as well as in terms of provision and maintaining safety workplace conditions.*

Conclusions. *Several recommendations were developed based on the analysis and conclusions of the research, which aimed at increasing the safety of pharmaceutical workers in public health emergencies such as epidemics or pandemics.*

Cuvinte cheie: *farmacie, activitatea farmaceutică, securitate, loc de muncă, pandemie COVID-19.*

SIGURANȚA LA LOCUL DE MUNCĂ A FARMACIȘTILOR ÎN PERIOADA PANDEMIEI COVID-19

Introducere. *Aparent s-ar părea că riscurile la care sunt supuși farmaciștii în timpul urgențelor de sănătate sunt cu mult mai mici, comparativ cu lucrătorii medicali din alte sectoare ale sănătății (asistența medicală primară, asistența medicală de urgență sau cea din spitale). În cadrul prezentului articol a fost efectuată o evaluare a riscurilor la care au fost supuși farmaciștii în perioada pandemiei COVID-19, precum și o analiză a măsurilor aplicate privind asigurarea securității la locul de muncă, în vederea propunerii recomandărilor pentru protecția farmaciștilor și minimizarea factorilor de risc.*

Material și metode. *În decursul cercetării a fost efectuat un studiu cantitativ și unul calitativ. Studiul cantitativ a fost realizat în baza unui eșantion constituit din 336 de farmaciști și laboranți farmaciști, din cadrul diferitor tipuri de farmacii. Studiul calitativ a fost efectuat în baza interviurilor, în profunzime, cu 8 reprezentanți din diferite domenii ale sectorului farmaceutic.*

Rezultate. *Rezultatele cercetării au reflectat mai multe aspecte privind rolul farmaciștilor în pandemia COVID-19, riscurile la care sunt supuși, morbiditatea în rândul farmaciștilor în perioada pandemiei, precum și asigurarea și menținerea condițiilor de securitate la locul de muncă al acestora.*

Concluzii. *În baza analizei și concluziilor cercetării, au fost elaborate mai multe recomandări orientate spre ameliorarea protecției lucrătorilor farmaceutici, în cazul unor urgențe de sănătate publică:- epidemii sau pandemii.*

INTRODUCTION

During the pandemic period, when patient access to hospitals and polyclinics is restricted, the pharmacist's role in the health system during the pandemic is even more significant than ever, since the pharmacy is the first line of contact, whereas the pharmacist's advice is quite valuable. The responsibility assumed by pharmacists during the pandemic is growing essentially. It is important to perform activities professionally and properly, however a protected and safe environment is important as well (1, 2, 3).

Pharmacists' activities have been specifically redesigned during the COVID-19 pandemic. Throughout the COVID-19 pandemic, pharmacists have assumed increasingly important roles in the identification, management and treatment of patients (4, 5).

Pharmacists working not only in community pharmacies, but also in hospitals, in clinical biology laboratories, in treatment and vaccine research and development, in the pharmaceutical supply chain, pharmaceutical warehouses, in the academic sector and in other sectors have provided all the best of their commitment to services, ensuring continuity of care, access to medicines, medical products and devices, personal protective equipment and provided evidence-based information and advice to the population, helping to control and contain the pandemic, as well as the efficiency and resilience of health systems (6, 7, 8). *The purpose of the study*: To analyse and assess the safety measures applied to pharmacists at work during the COVID-19 pandemic in order to develop specific recommendations to protect the pharmacists and reduce the risk factors.

MATERIAL AND METHODS

A mixed quantitative and qualitative study was conducted. The study revealed the results of the opinion poll based on the assessment of the study participants (pharmacists, the managers of a pharmacy from community and private pharmacies from Republic of Moldova; the manager of pharmacy/Help Net Pharma from Romania; the expert of WHO from Republic of Moldova) on workplace safety during the COVID-19 pandemic.

Quantitative study – the type of fully descriptive study that was carried out based on a sample of 336 pharmacists with higher education and pharmacist laboratory assistants with complete secondary education. The survey was used within the pharmacies of 4 national networks via the Google Forms platform and within the hospital, departmental and paper-based pharmacies between November 2021 and March 2022. The subjects under study were assessed on the following: (a) preventive and control measures of the COVID-19 infection; (b) the main sources of information for the respondents regarding the COVID-19 infection; (c) the provision and maintenance of satisfactory hygienic conditions at the workplace; (d) the existing procedures in terms of providing preventive and control measures of the COVID-19 infection at work; (e) normative framework regarding safety provision at the pharmacist's workplace during the pandemic; (f) the degree of satisfaction/dissatisfaction with protection at the workplace; (g) identification of the necessary measures to be taken in order to improve the protection of pharmacists and reduce the risk factors occurring at workplace.

Qualitative study – a type of semi-structured study based on in-depth interviews with open questions conducted on 8 representatives during February – March 2022. Out of 8 participants, 3 respondents work in community/private pharmaceutical units, 1 – in departmental/public pharmacy, 1 – in hospital/public pharmacy, 1 – in *Vasily Procopisin* University Pharmaceutical Center, *Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova, 1 – WHO representative from Healthcare Department, 1 respondent from private pharmacy Help Net Pharma, Romania. The sample selection was based on the seriousness and professional competences of the participants working in different structures of the pharmaceutical field in order to achieve the proposed objectives: a) to assess how the pharmaceutical activity was ensured during the COVID-19 pandemic according to legislation; b) what impediments were encountered during the pandemic; c) to what extent were the workplace safety measures applied to pharmacists.

The research methods included the historical method, analytical method, mathematical method, statistical method and the comparative method.

RESULTS

According to the survey, pharmacists are as exposed to the risk of infection as other heallthcare providers from Republic of Moldova, thus 47% of cases of COVID-19 infections were reported during this period (fig. 1).

Only 40% of pharmacists were trained at work on the compliance with the preventive measures of COVID-19 infection, although this was one of the most important recommendations (based on the respondents' survey).

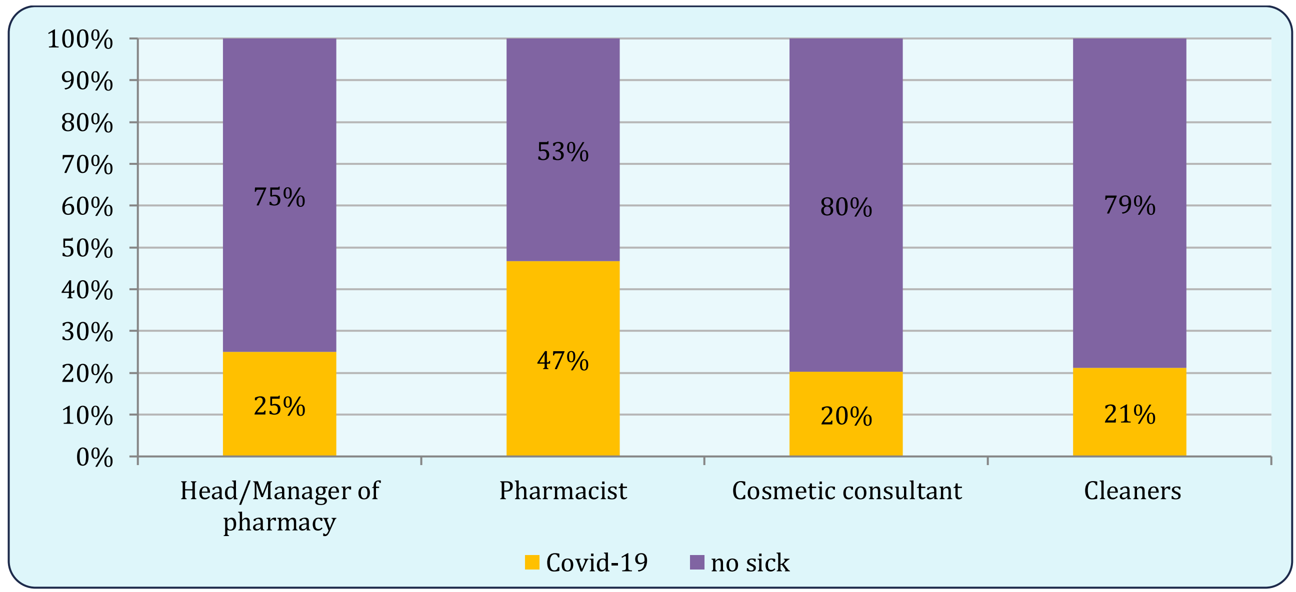

Figure 1. COVID-19 infection risks at workplace.

Out of pharmacies providing 24-hour services, 57% of pharmacists worked overtime, not complying with the work schedule according to the Labour Code (fig. 2), which led to overwork. In most pharmacies, there were no satisfactory working conditions, contrary to the recommendations of the Ministry of Health, Order no. 302/2020 (fig. 3) (9).

Pharmacists were not provided with the necessary equipment at the workplace (72% of pharmacists received masks, 67% – gowns, 55% - gloves, 45% – caps, 35% – visors). Only 22% of pharmacists studied official regulations during the COVID-19 pandemic and only 36% of pharmacists felt secure at work (according to survey respondents).

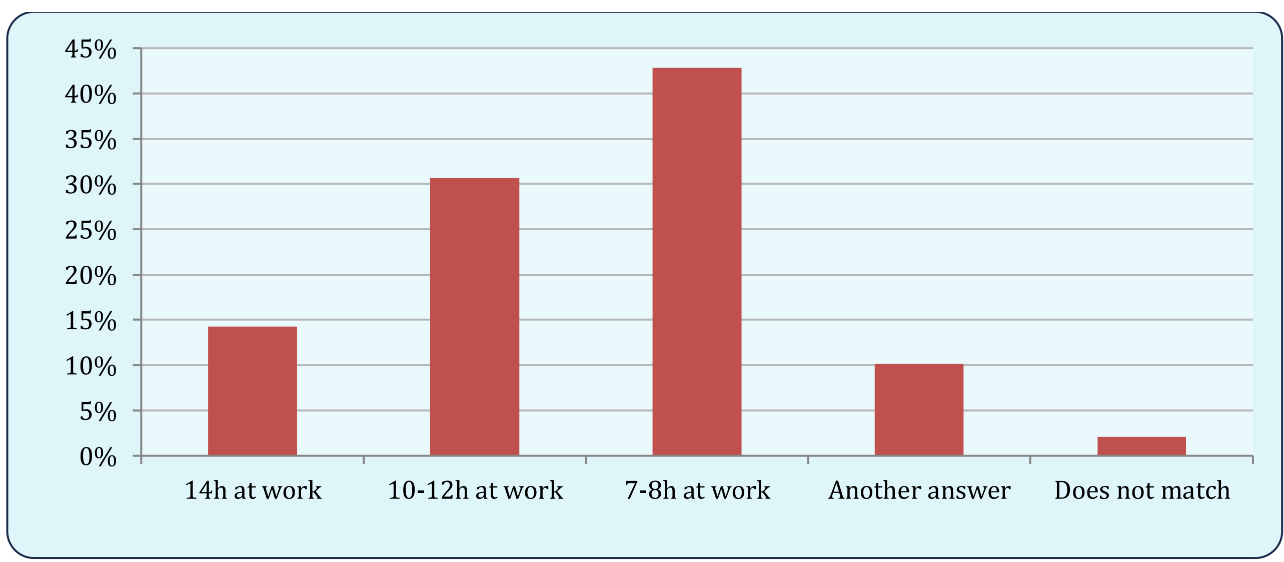

Figure 2. Working hours within the pharmacy.

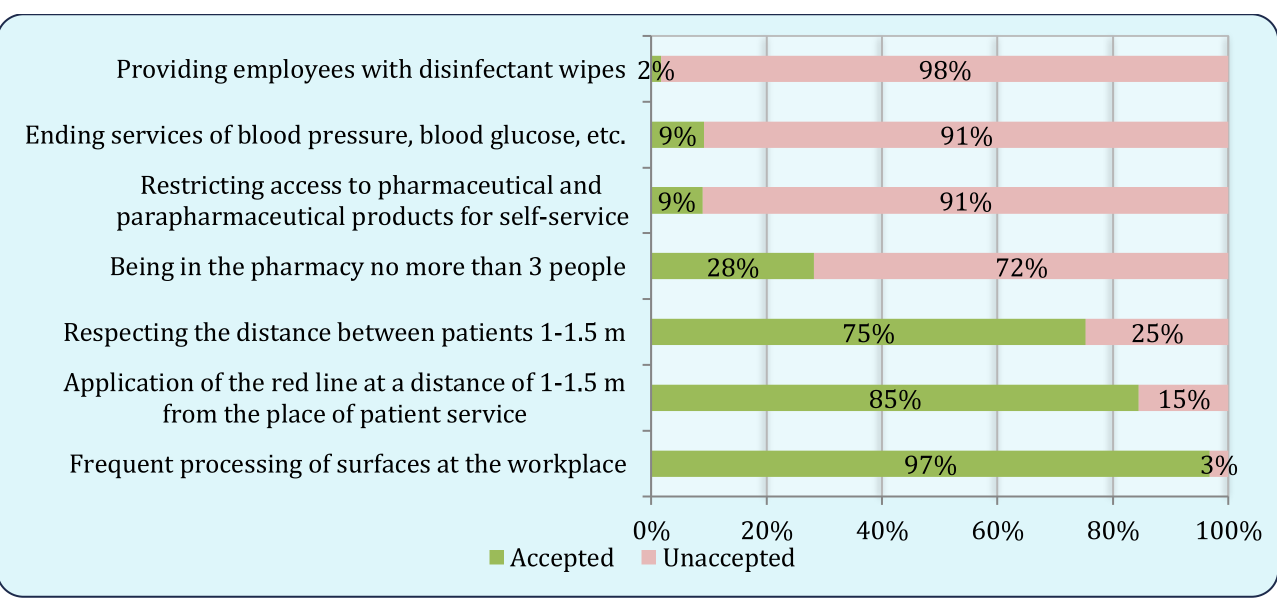

Figure 3. Providing and maintaining appropriate working conditions.

Community pharmacies are usually the first point of direct contact with the population suffering from health problems. As the first point of contact with risk factors, the pharmacist becomes the person most exposed to infections compared to other healthcare workers. This is evidenced by the answers collected by respondents to the question about the average number of people with whom they communicate daily. On average, 49% of respondents interact with approximately 100-200 people per day, 25% interact with less than 100 people per day, 19% of respondents interact with an average of 200-300 people per day, 19% of respondents interact with more than 300 people per day (these respondents indicated that they worked in pharmacies with a round-the-clock schedule without a break during the pandemic) (fig. 4).

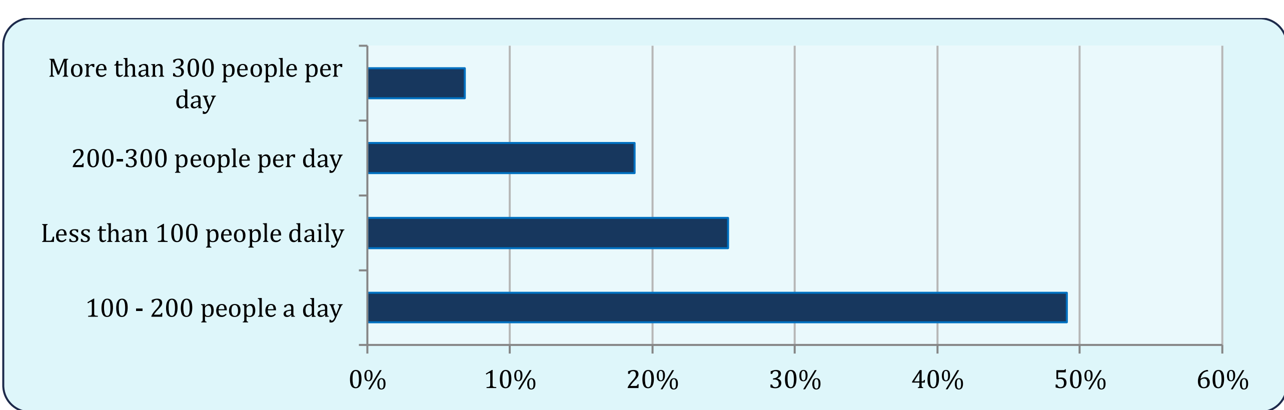

Figure 4. The average number of people to whom the pharmacist interacts with daily.

In the case of closed pharmacies/medical facilities, the risk of illness is much lower given the fact that the pharmacist interacts mainly with medical staff and less with inpatients.

According to the in-depth interviews of the participants on what extent the safety of pharmacists was ensured at the workplace, ranging on a scale from 0-10 (extremely ineffective – extremely effective): the safety of pharmacists was assessed by 2 representatives working in the public sector with 8 points, 1 representative – 9 points; 3 representatives from the private sector of the Republic of Moldova – with a score of 7; The WHO representative rated the safety of pharmacists – 7 points, and only the representative from Romania claimed as extremely effective – 10 points.

DISCUSSIONS

Both the results of the survey and in-depth interviews showed that the infectious disease doctor

and/or an expert group formed by an infectious disease doctor and the head of the COVID-19 department, played a special role in informing the pharmacy employees on current regulations, as well as in training them on appropriate procedures applied during the COVID-19 pandemic and assessing the existing procedures on the protection and safety of pharmacists during the COVID-19 pandemic. One of the differences between the departmental and hospital pharmacies was the presence of green corridors, where only healthy population had access, compared to community pharmacies, where the pharmacist was constantly exposed to risk factors by contacting potential patients. In both categories of respondents, it was mentioned that the pharmacy managers provided pharmaceutical activity according to the working hours stipulated in the Labour Code by performing a rotational 7-8 hour shift work per each pharmacist; by providing a shortened work schedule, as required; and by protecting the retired pharmacists who stayed at home. The respondents of both groups stated that they ensured the safety of pharmacists at work to a fairly effective extent by applying basic preventive measures, according to the Ministry of Health, Order no 315/2020 (10).

The in-depth interviews showed that one of the impediments was the incorrect distribution of personal protective equipment (PPE) at the workplace. Some pharmaceutical units stored PPE for several days while the other ones were not sufficiently provided, especially after the 2020 March alert. Another problem was the training of pharmaceutical staff regarding protective measures at the workplace, since these trainings were of a general profile where WHO and Primary Healthcare (PHC) provided informative materials, whereas more than half of the pharmacists self-trained. More effective management of PPE distribution and training of pharmacists during the crisis should be considered.

The in-depth interviews in terms of specific measures taken in case of a possible detection of COVID-19 case or outbreak at the workplace revealed that the participants reported different actions depending on the specifics of the pharmacy: (a) the extra-budgetary pharmacy activating within the Public Medical-Sanitary Institution of Ministry of Internal Affairs (PMSI MIA) was closed and only the hospital pharmacy dispensed medicines and those necessary to hospital units, including the COVID-19 ward; (b) the pharmacy of the Institute of Emergency Medicine (EMI) used a protective film on the territory to avoid direct contact with patients; (c) in case of COVID-19 detection, the pharmacy from Romania was closed during a day for total disinfection by DSP (Epidemiological Dispatch from Romania); (d) pharmacists from community/private pharmacies from the Republic of Moldova had to work overtime and were not always appropriately paid.

According to the WHO interviewee, the normative framework regarding the safety workplace conditions of pharmacists during the COVID-19 pandemic was unsatisfactory, because the national recommendations were general for all economic agents, while the Protocols were developed only for doctors. However, the study shows that there is a need for more specific recommendations for pharmacists via some Guidelines and National Protocols.

The following important moments were mentioned while interviewing the manager of the private pharmacy from Romania: (a) pharmacists were provided with 100% PPE; (b) pharmacists were regularly trained by a group of experts, being aware of the current regulations; (c) official sources only from the Ministry of Health were used; (d) the infected pharmacists were monitored via an online platform; e) the pharmacists were provided with free treatment by the company they worked in; (f) in case of a possible COVID-19 infection/outbreak at the workplace, the pharmacy was subjected to total disinfection by the DSP (Epidemiological Dispatch from Romania); (h) pharmacists felt protected at work 100%.

CONCLUSIONS

1. Occupational infection of pharmacists/laboratory pharmacists with COVID-19 accounted for 47% of the total number of pharmaceutical personnel, thus both pharmacists and medical workers from other healthcare sectors, have been and are at the forefront of responding to COVID-19 pandemic.
2. Despite the implemented safety and preventive measures against COVID-19 infection at the workplace, there are some challenges such as limited availability of personal protective equipment, high risk of infection through contact with potential patients, and legal barriers to providing accurate workplace safety information to pharmacists during the COVID-19 pandemic.

3. The impact of government decisions on pharmaceutical practice, the activities and responsibilities of the owners and managers of pharmacies in both the private and public sectors are not effective enough to protect pharmacists at work, as well as to minimize risk factors.
4. The safety of pharmacists must be guaranteed by the employer. A unified system of measures and rules applicable at the workplace within pharmacies should be provided. The study showed that pharmaceutical workers were not sufficiently trained and informed on the compliance with safety workplace measures, thus, 60% of pharmacists self-trained.

RECOMMENDATIONS

1. Development and approval of the Practical Guide for pharmacists regarding safety at work during times of crisis to minimize risk factors.
2. Ensuring the coordination of preparation and response measures at the level of pharmaceutical units and their subsidiaries by economic agents.
3. The adjustment of normative acts and the introduction of general provisions regarding key measures for the prevention of infections at the workplace in separate Practice Guides for managers and pharmacists.

CONFLICT OF INTERESTS

Authors declare no conflict of interests.

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ETHICAL APPROVAL

No, the opinion from the ethics committee.

REFERENCES

1. Hancu G. *Pharmaceutical assistance - an important concept in modern pharmacy*. 2021. Available from: https://www.universfarmaceutic.ro/punct/asistenta-farmaceutica-un-concept-important-in-farmacia-moderna [Accessed 15.11.221].
2. Jūratė Š. *Overview of Community Pharmacy Services in Europe*. 2016. Available from: https://www.oecd.org/els/health-systems/Item-2b-Overview-Community-Pharmacy-Services-Svarcaite%20.pdf [Accessed 15.11.2021].
3. International Pharmaceutical Federation (FIP). *Responding to disasters: Guidelines for Pharmacy 2016. Hague Int. Pharm. Fed.* 2016. Available from: http://fip.org/files/fip/publications/2016-07-Responding-to-disasters-Guideline.pdf [Accessed 3.01.2022].
4. World Health Organization. *The legal and regulatory framework for community pharmacies in the WHO European Region*. Available from: https://apps.who.int/iris/bitstream/handle/10665/331232/9789289054591-rus.pdf [Accessed 05.01.2022].
5. World Health Organization. *Guide Covid-19: Occupational health and safety for health workers.* Available from: https://hlh.who.int/docs/librariesprovider4/hlh-documents/covid-19-occupational-health-and-safety-for-health-workers.pdf?sfvrsn=581e60c6_5 [Accessed 14.02. 2022].
6. García-Martín Á, Maroun-Eid C, Campino-Villegas A, Oliva-Manuel B, HerreroAmbrosio A, Quintana-Díaz M. Perception survey on the value of the hospital pharmacist at the emergency department. Farmacia Hospitalaria. *Sociedad Es panola de Farmacia Hospitalaria*. 2022;41(3): 357-370. doi:10.7399/fh.2017.41.3.10687
7. Murray R. Community Pharmacy Clinical Services Review. *NHS England-Independent Rev.* 2016. Available from: https://www.england.nhs.uk/commissioning/wpcontent/uploads/sites/12/2016/12/community-pharm-clncl-serv-rev.pdf [Accessed 13.03.2022].
8. Zlatan KC, Hemal K, Bero L, Stein J. Staff perceptions of an on-site clinical pharmacist program in an Academic Emergency Department after one year. *West. J. Emerg. Med.* 2014;15(2):205-210.
9. Ministry of Health Order no 302/2020 "*Regarding the provision of measures to prevent and control the infection with the new type of coronavirus COVID-19 in pharmacies*". Published March 2020.
10. Ministry of Health Order no 315/2020 "*Regarding the provision of measures to prevent the infection of coronavirus COVID-19 at the workplace*". Published March 2020.

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PHARMACISTS' WORKPLACE SAFETY DURING THE COVID-19 PANDEMIC

Cornelia SÎRBU[1], Irina SAGAIDAC[2], Adriana PALADI[3]

[1]*Gheorghe Paladi* Municipal Clinical Hospital, Chisinau, the Republic of Moldova
[2]*Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova
[3]School of Public Health Management, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Corresponding author: Cornelia Sirbu, e-mail: sirbucornelia@mail.ru

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Keywords: *accessibility, family planning services (FPS), unintended pregnancy, safe abortion care (SAC), contraception, COVID-19.*

Introduction. *The aim of the research was to evaluate the accessibility of family planning services and safe abortion care during the COVID-19 pandemic and develop necessary recommendations for maintaining and improving the provision of these services in pandemic situations.*
Material and methods. *To achieve the aim, a descriptive cross-sectional study was conducted from 01.11.2021 to 01.02.2022 on a sample of 213 obstetrician-gynecologists and 320 women of reproductive age. The collected data were analyzed using SPSS software.*
Results. *FPS and SAC were reported to be incompletely provided during the COVID-19 pandemic by 42.7% of obstetrician-gynecologists. Limited access was also reported by 46.9% of beneficiaries of these services. Common obstacles/challenges regarding access to FPS and SAC include: insufficient information about COVID-19, fear of infection, doctors with COVID-19, imposed quarantine, overloaded work schedules of doctors, cessation of public transport with limited mobility, etc.*
Conclusions. *The COVID-19 pandemic has resulted in a limitation of access to FPS and SAC, experienced by both beneficiaries and service providers at the country level. Analysis of obstacles and opportunities in the provision and access to services can serve to identify measures for broader accessibility to FPS and SAC in public health emergencies. There is an urgent need for policies and procedures whose implementation would ensure equitable and timely access to FPS and SAC in PHE, including the application of telemedicine as a modern tool.*

Cuvinte cheie *accesibilitate, servicii planificare familială (SPF), sarcină nedorită, avort în siguranță (AS), contracepție, COVID -19.*

ACCESIBILITATEA SERVICIILOR DE PLANIFICARE FAMILIALĂ ȘI AVORT ÎN SIGURANȚĂ ÎN CONDIȚIILE PANDEMIEI COVID-19 ÎN REPUBLICA MOLDOVA

Introducere. *Scopul cercetării l-a constituit evaluarea accesibilității SPF și AS în condițiile pandemiei cu COVID-19 și elaborarea recomandărilor necesare pentru menținerea și ameliorarea prestării serviciilor date în circumstanțele respective.*
Material și metode. Pentru atingerea scopului a fost realizat un studiu transversal descriptiv, în perioada 01.11.2021 – 01.02.2022, pe un eșantion de 213 medici obstetricieni-ginecologi și unul pe un lot de 320 femei cu vârstă reproductivă. Datele colectate au fost analizate aplicându-se programul SPSS.
Rezultate. *Medicii obstetricieni-ginecologi au raportat, într-o proporție de 42,7%, că SPF și AS, în timpul pandemiei COVID-19, au fost prestate incomplet . Accesul limitat a fost semnalat și de beneficiarii acestor servicii în proporție de 46,9%. Printre obstacolele/provocările comune privind accesul la SPF și AS se cer remarcate: informație insuficientă despre COVID-19, frica de infectare, medici bolnavi de COVID-19, starea de carantină impusă, program de lucru suprasolicitant al medicilor, sistarea transportului public cu limitarea deplasărilor etc.*
Concluzii. *Pandemia COVID -19 a determinat limitarea accesibilității SPF și AS, resimțită de beneficiari și de prestatorii de servicii la nivel de țară. Analiza impedimentelor și oportunităților în prestarea și accesarea serviciilor poate servi pentru identificarea măsurilor ce ar facilita accesibilitatea SPF și AS în USP. Se impune urgent punerea în aplicare a unor politici și proceduri ce ar asigura acces echitabil și în timp util la SPF și AS în USP – inclusiv utilizare unor a instrumente moderne, cum ar fi telemedicina.*

LIST OF ABBREVIATIONS: ***SAC*** – safe abortion care; ***YFHC*** – youth friendly health centers; ***FPS*** – family planning services; ***UNFPA*** – United Nations Population Fund; ***PHE*** – public health emergencies; ***PPE*** – personal protective equipment

INTRODUCTION

Family planning is an integral part of human reproductive rights. According to the Programme of Action adopted at the International Conference on Population and Development, every person has the right to decide freely on the number of children they want, the interval between pregnancies, and the appropriate time to plan their pregnancy, as well as whether they want to have children (1). With the onset of the COVID-19 pandemic worldwide, a large part of routine health services have been suspended or postponed by both public and private institutions in most countries, except for family planning services (FPS) and safe abortion care (SAC).

Multiple studies report reduced accessibility to FPS and safe abortion during the COVID-19 pandemic worldwide, estimate the adverse consequences of these access limitations, and reveal increased inequalities under the burden of pandemic restrictions. It is stated that the COVID-19 pandemic has led to service disruptions that have affected access to abortion, contraceptives, HIV/STI testing, and changes in sexual behaviors, menstruation, and pregnancy intentions (2); has led to reduced or lack of access to contraceptives, increased number of unintended pregnancies and unsafe abortions (3); and an estimated increase in maternal mortality as a result (4).

Although the full impact of the COVID-19 pandemic is not yet fully estimated, it is relatively clear that it is felt especially by economically vulnerable populations, ethnic groups, and/or based on gender criteria. Multiple studies indicate an increase in inequalities as a result of the COVID-19 pandemic (5, 6, 7). According to UNFPA data, in the first year of the pandemic, about 12 million women in 115 low- and middle-income countries had limited or no access to family planning services, resulting in 1.4 million unintended pregnancies. UNFPA notes that access to FPS is limited due to travel restrictions, unstable supply of contraceptives, and disrupted health services (8).

According to research by the Guttmacher Institute, the onset of the COVID-19 pandemic has changed the social and economic realities of people around the world: the imposition of social distancing, travel restrictions, job losses, and more. All of these have led to increased economic and social insecurity, which is unequally felt by different populations. A national survey of 2,009 respondents in the United States conducted at the beginning of the COVID-19 pandemic revealed that women's access to contraception and other family planning services, as well as their ability to pay for these services, has been restricted, resulting in delayed and deferred care.

The topic discussed in the context of increased access to services during pandemics is telemedicine. There is an increasing consensus that the role of remote services is crucial in pandemics. Since the virus that causes COVID-19 is transmitted through the air, it is recommended that all consultations related to FPS be done remotely, except in cases where a visit is absolutely necessary. The initiation of the use of contraception and medical abortion can be done through telemedicine for most women. According to the given study, more than 30% of the surveyed women sought FPS and safe abortion care later than the allowed deadline, with the proportion of low-income women being 36%, while that of higher-income women being 31%. The same trends of delayed access to safe abortion care persist with regard to ethnic belonging, as women from minority ethnic groups report more limited access to FPS compared to women belonging to the majority ethnic groups in the country (9).

The development of new delivery services, extended use of contraceptives, implementation of telemedicine for FPS and medical abortion significantly reduces the need for in-person visits by women and their access to FPS and safe abortion. The transition from in-person to virtual consultations is welcome, as it anticipates unplanned pregnancies, unsafe abortions without endangering the health of the beneficiaries, and without delaying the counseling process due to difficult appointments (10 - 13).

Based on international studies regarding the reduction of access to FPS and SAC during the COVID-19 pandemic, our goal is to evaluate how the accessibility of FPS and voluntary termination

of pregnancy under safe conditions in the Republic of Moldova has been influenced/affected by the pandemic, according to service providers and beneficiaries. This evaluation will help us develop necessary recommendations to maintain and improve the provision of these services during pandemics, as well as policies aimed at reducing inequalities in the system.

MATERIAL AND METHODS

The study was conducted in 8 urban territories, 16 rural territories, and the country's capital.

To achieve the set aim, we conducted a cross-sectional, descriptive study by surveying 213 obstetrician-gynecologists and 320 women of reproductive age, between November 1, 2021, and February 1, 2022, in 8 urban territories, 16 rural territories, and the country's capital. The study evaluated the opinions of service providers on the organization of FPS and safe abortion during the pandemic and the opinions of women of reproductive age about access to FPS and safe abortion care during the COVID-19 pandemic. When developing the questionnaires, scientific standards and relevant data from international studies were taken into account. The questionnaire for physicians consisted mostly of 24 pre-determined response questions, while the one for women contained 22 closed-ended questions. The questionnaires were partially distributed online (Google forms) and on paper support. The collected data were analyzed using the SPSS software. The study conducted a descriptive analysis of the collected data according to selected parameters (age, occupation, place of residence, etc.) correlated with the set aim.

RESULTS

Activity of FPS and SAC during the COVID-19 pandemic according to service providers: The research involved obstetrician-gynecologist doctors aged from less than 35 to over 66, who work in various institutions (tab. 1).

Table 1. The sample of respondent physicians grouped by age and workplace.

Age groups		Workplace	
< 35 years	13.1%	Gynecology department of hospital institutions	31.9%
36 - 45 years	21.1%	Health centers	28.6%
46 - 55 years	31.9%	Youth friendly health centers (YFHC)	18.8%
56 - 65 years	26.4%	Family planning clinic	12.7%
> 66 years	7.5%	Abortion clinic	7.0%

The activity carried out during the COVID-19 pandemic was mostly perceived by physicians as burdensome due to the necessity of wearing PPE – 51.6%; more stressful due to the increased risk of infection – 25.8%; 12.2% of respondents consider that the activity remained the same, while 8.9% of respondents state that the activity changed completely due to the need for physicians to be redirected to provide medical assistance to COVID-infected patients, but 1.5% did not answer. The work schedule was viewed as "with double effort" by 47.4% of physicians, but 26.3% of physicians believe that the schedule was extended due to the large number of requests, while 16% believe that the schedule remained the same and only 8.9% are sure that the schedule was shortened due to the lower number of requests, 1.4% were unable to respond.

The data on the accessibility of services is controversial, on the one hand, physicians estimate that: services were provided incompletely in 42.7%; some physicians believe that women had full access to FPS and safe abortion care to the extent of 39.4%; while 15.5% of physicians report that women did not have access to services, and 2.4% of physicians did not respond to this question.

Regarding the aspects of access to particular types of services (such as contraception and abortion), it was found that: the majority of respondents (38.5%) believe that women had access to contraception, but there was not enough diversity of contraceptive methods; 35.2% of physicians reported having sufficient contraceptives each time women needed them; and 25.4% of physicians stated that access was limited and that contraceptive methods were lacking in their institutions, 0.9% of physicians did not respond.

Regarding abortion: 56.4% of gynecologists consider that the number of abortions has decreased; 16.0% stated that the number of abortions remai-

ned the same, while 10.3% reported that the number of abortions has increased, but 17.3% of physicians did not respond. This indicates a reduction in accessing the service, directly confirmed by 56.4% of respondents.

The pandemic has led to a modification of service delivery methods, namely the provision of remote consultation services (telephone/telemedicine services). Moldova has become the first country in Eastern Europe and Central Asia to integrate the service of medical abortion through telemedicine into the National Standards for Safe Abortion. The study found that physicians in the age category of 46-55 years are more optimistic about consultations offered by telephone/telemedicine compared to those aged 66 and over (fig. 1).

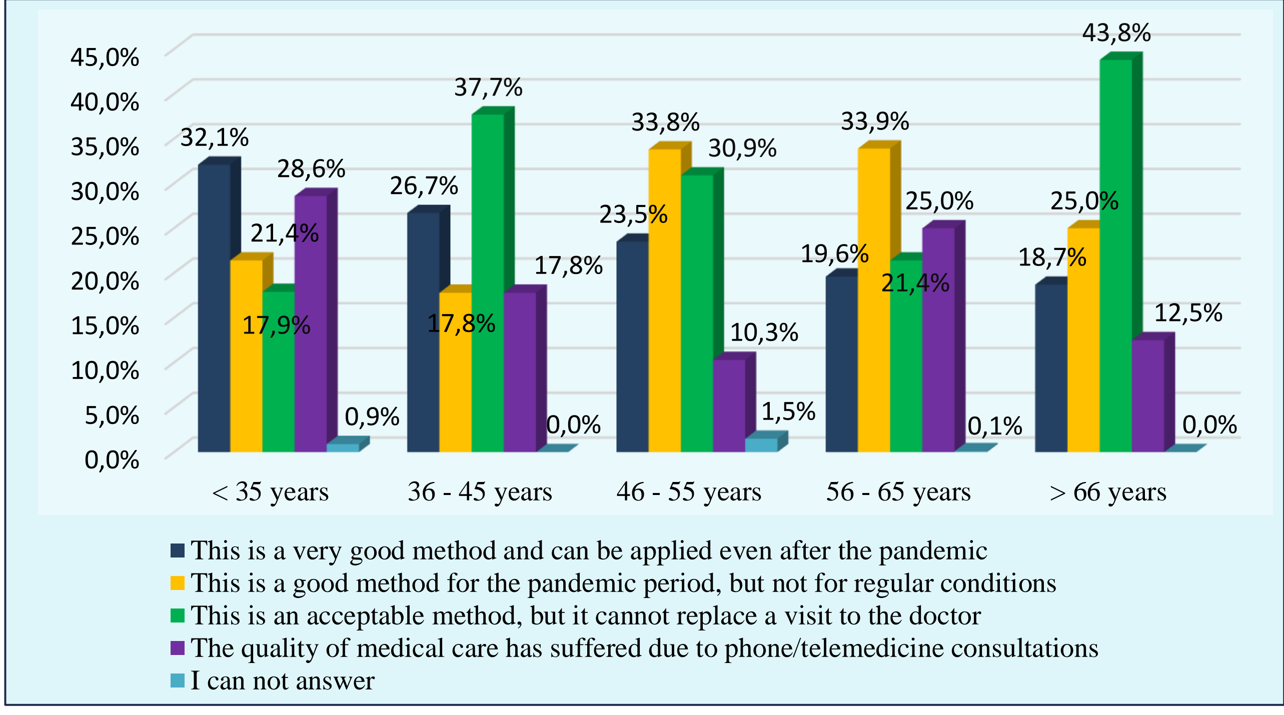

Figure 1. Assessment of the quality of consultations provided by phone/telemedicine during the pandemic (the opinion of gynecologist physicians), %.

Accessibility of FPS and SAC during the COVID-19 pandemic according to beneficiaries' opinions: The study involved reproductive-aged women living in the capital city (60.3%), urban areas of Moldova (25%), and rural areas (14.7%). Regarding access to services, the respondents noted that during the pandemic, they had limited access to FPS and SAC to the extent of 46.9%. 39.7% of respondents considered that they had access to all services similar to the period before the pandemic, while 13.4% avoided answering. The greatest obstacle for women in obtaining FPS and safe abortion care, as stated by them, was fear of contracting COVID-19 (31.7%), quarantine measures (24.9%), suspension of public transport (12.9%), and lack of financial means (12.6%) (fig. 2).

According to gynecologists, women were unable to access safe abortion services due to several reasons: fear of getting infected with COVID-19 (50%); inability to travel due to the suspension of public transport caused by quarantine (21.5%); lack of financial means to travel to the medical facility (13.2%); imposed quarantine (8.7%); lack of a phone or computer to communicate with the physician (5.8%); and 0.8% reported that women did not have information about FPS and safe abortion care.

Analyzing the level of satisfaction with access to FPS during the pandemic on a scale from 1 to 10, where 1 is completely dissatisfied and 10 is very satisfied, we found that a high level of satisfaction was recorded among women living in rural areas, a lower level of satisfaction among women in cities, and beneficiaries in the capital were found to be less satisfied with access to FPS and SAC during the pandemic period (fig. 3).

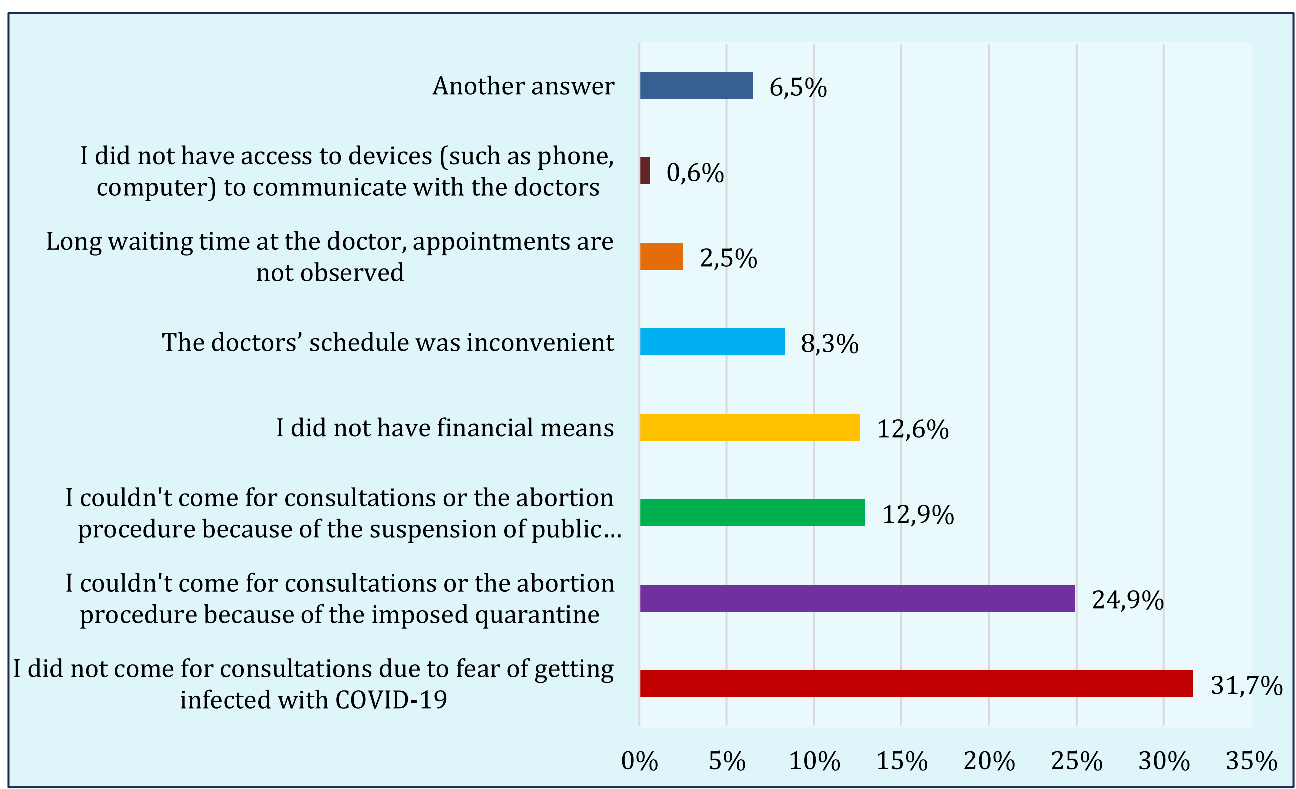

Figure 2. Barriers faced by women in accessing safe abortion and contraception services.

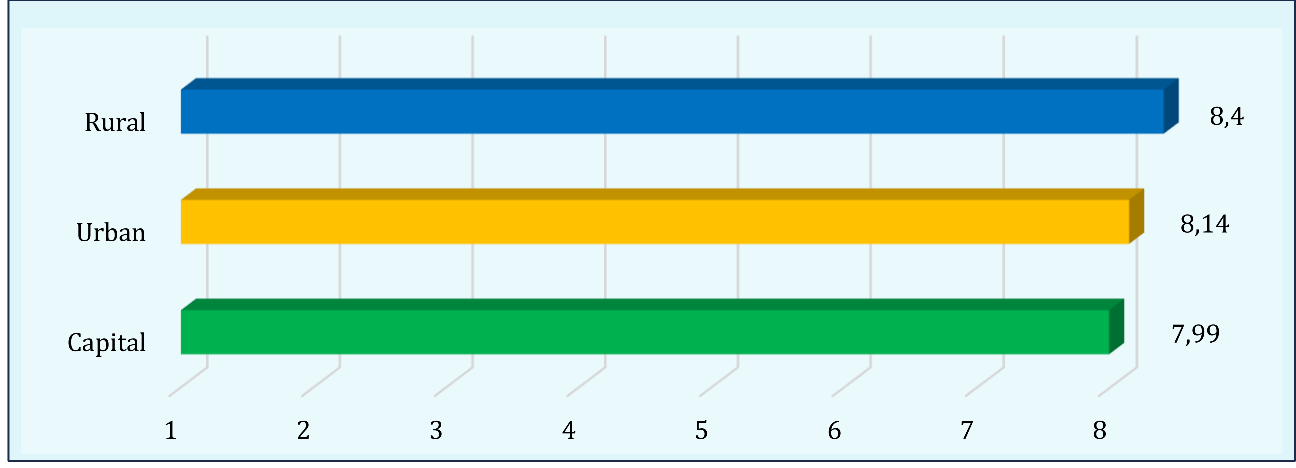

Figure 3. Assessment of the accessibility of FPS and SAC during the COVID-19 pandemic, depending on the place of residence (women's opinion) (%).

DISCUSSIONS

According to research by the Guttmacher Institute in the United States – a research and policy institute committed to promoting SRHR and advocating for the principles of equity and justice and prioritizing sexual and reproductive rights, both in the US and worldwide – with the onset of the COVID-19 pandemic, a large proportion of medical institutions that provided FPS and safe abortion either closed or reduced their activity, resulting in a reduction of up to 80% of these services, namely contraception and safe abortion care (14). As a result, a reduction of only 10% in FPS and safe abortion care led to approximately 15 million unplanned pregnancies, of which more than 3 million would be terminated under unsafe conditions, with 28,000 cases resulting in maternal deaths (15).

Another two-year comparative study, before and during the COVID-19 pandemic, on safe abortion care and FPS was conducted at the maternity and women's hospital in Paropakar, Nepal. The study showed that safe abortion decreased by 34.4%, and family planning by 39%, in 2020 compared to the previous year. The shortage of contraceptives was felt through unwanted pregnancies and unsafe abortions. The COVID-19 pandemic drastically affected family planning and safe abortion in Nepal due to quarantine, home isolation, resource reallocation for COVID-19 control, and travel restrictions.

Un has presented a report on the impact of COVID-19 on reproductive health, in which it reported that IPPF member nations have difficulties in ensuring access to contraceptives, 59 countries have reported disruptions in the transportation of goods within the countries, and 29 countries have reported that they have problems due to a total lack of contraceptives.

The pandemic has created a health crisis with adverse effects on women, service providers, and the entire global health system, and Moldova is no exception. This study confirms the findings of other research on the limited access to FPS and SAC during the pandemic. In the study, we found that the COVID-19 pandemic negatively influenced the activity of FPS and SAC providers by: (a) increasing physical workload due to pandemic restrictions and rules, which was burdensome due to the need to wear PPE – 51.6% of doctors, (b) increasing stress levels among 25.8% of doctors due to the risk of COVID-19 infection, (c) the need for re-profiling in 8.9%, and (d) doubling the workload reported by 47.4% of doctors. These factors create conditions that favor the decrease in access and quality of FPS and SAC. At the same time, the study reveals a reduction in requests for services, which is also confirmed by 55.4% of physicians and 46.9% of respondents. Additionally, a reduction in requested abortions is observed by 31.5% of gynecologists. The main reasons for the reduced demand from study participants are fear of COVID-19 infection in 31.7%, imposed quarantine in 24.9%, suspension of public transport in 12.9%, and lack of financial means in 12.6%.

The uncertain political response to COVID-19 restrictions has increased inequities in access to abortion in Europe, the US, and the Republic of Moldova, but some innovations, including telemedicine during the COVID-19 pandemic, could serve as a catalyst to ensure continuity and equity of abortion care.

The research has shown that one third of obstetrician-gynecologists consider telemedicine consultations an acceptable method for the pandemic period and should be widely used.

CONCLUSIONS

1. The COVID-19 pandemic has reduced access to FPS and SAC in Moldova, a fact confirmed by both service beneficiaries and providers throughout the country, which reveals a violation/limitation of women's rights to essential services such as family planning and safe abortion.
2. COVID-19 restrictions have increased inequities in accessing safe abortion in the Republic of Moldova.
3. Telemedicine/distance services could serve as a catalyst for ensuring continuity and equity of services in pandemic situations. The development of a legal framework for regulating the provision of FPS at a distance, through telemedicine with periodic evaluation of the implementation of these services is recommended.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ETHICAL APPROVAL

The article was not approved by the Ethics Committee as it does not contain any ethical risks. The research consists of a survey of adults that maintains all rigor for anonymizing data and maintaining participant confidentiality.

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REFERENCES

1. United Nations. Report of the International Conference on Population and Development, Cairo, 5-13 September 1994, United Nations. New York, 1995. Available from: https://www.un.org/development/desa/pd/sites/www.un.org.develoment.desa.pd/ files/icpd_en.pdf [Accessed: 20th Aprile 2022].
2. Mukherjee TI, Khan AG, Dasgupta A, Samari G. Reproductive justice in the time of COVID-19: a systematic review of the indirect impacts of COVID-19 on sexual and reproductive health. *Reprod Health*. 2021;18(1):252.
3. Aly J, Haeger KO, Christy AY, Johnson AM. Contraception access during the COVID-19 pandemic. Contracept Reprod Med. 2020;5:17.
4. Riley T, Sully E, Ahmed Z, Biddlecom A. Estimates of the Potential Impact of the COVID-19 Pandemic on Sexual and Reproductive Health In Low- and Middle-Income Countries. *Int Perspect Sex Reprod Health.* 2020;46:73-76.
5. Cousins S. COVID-19 has "devastating" effect on women and girls. *Lancet*. 2020;396(10247):301-302.
6. Hall KS, Samari G, Garbers S, Casey SE, Diallo DD, Orcutt M, Moresky RT, Martinez ME, McGovern T. Centring sexual and reproductive health and justice in the global COVID-19 response. *Lancet*. 2020;395(10231):1175-1177.
7. Webb Hooper M, Nápoles AM, Pérez-Stable EJ. COVID-19 and Racial/Ethnic Disparities.*JAMA.*2020;323(24):2466–2467.
8. UNFPA. Impact of COVID-19 on Family Planning: What we know one year into the pandemic., 2021. Available from: https://www.unfpa.org/sites/default/files/resource-pdf/COVID_Impact_FP_V5.pdf) [Accessed: 20th Aprile 2022].
9. Lindberg LD, VandeVusse A, Mueller J, Kirstein M. *Early impacts of the COVID-19 pandemic: findings from the 2020 Guttmacher Survey of reproductive health experiences*. Guttmacher Institute, 2020.
10. Aiken A, Starling JE, Gomperts R, Tec M, Scott JG, Aiken CE. Demand for self-managed online telemedicine abortion in the United States during the coronavirus disease 2019 (COVID-19) pandemic. *PubMed.gov*. 2020;136(4):835-837.
11. Aiken A**,** Starling JE, van der Wal A, et al. Demand for self-managed medication abortion through an online telemedicine service in the United States. *Am J Public Health*. 2020;110(1):90-97.
12. Aiken A, Starling JE, Gomperts R, Scott JG, Aiken C, Rubin J, et al. Demand for self-managed online telemedicine abortion in eight European countries during the COVID-19 pandemic: a regression discontinuity analysis. *BMJ Sex Reprod Health.* 2021;47(4):238-245.
13. Stanton T, Bateson D. Effects of the COVID-19 pandemic on family planning services. *Current Opinion in Obstetrics and Gynecology.* 2021;33(5):425-430.
14. Lindberg LD, VandeVusse A, Mueller J, Kirstein M. *Early impacts of the COVID-19 pandemic: findings from the 2020 Guttmacher Survey of reproductive health experiences*. New York: Guttmacher Institute. 2020. doi:10.1363/2020.31482
15. Mishra S, Rana T, Adhikary S, Paudel S, Sah P. Impact of COVID-19 pandemic on safe abortion and family planning services at a tertiary care women's hospital in Nepal. *International Journal of Reproduction*, Contraception, Obstetrics and Gynecology. 2021;10(6):2453-2458. doi:10.18203/2320-1770.ijrcog20212192

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Irina SAGAIDAC, SCOPUS ID: 4520466, WoS ID: 57031928100

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COLLABORATION OF THE PUBLIC HEALTH SERVICE WITH PRIMARY HEALTH CARE AT THE TERRITORIAL LEVEL

Alexandr CORNEI, Valentin MITA, Oleg LOZAN

School of Public Health Management, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, the Republic of Moldova

Corresponding author: Alexandr Cornei, e-mail: alexandrcornei@gmail.com

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Keywords: *intersectoral cooperation, public health service, primary health care, barriers.*

Introduction. *Intrasectoral collaboration in public health represents a huge potential for optimizing the three fundamental public health actions: disease prevention, health protection and healthcare awareness. The COVID-19 pandemic has significantly impacted the engagement of the parties particularly interested in disease prevention and control.*
Material and methods. *A mixed qualitative and quantitative research (in-depth interviews/questionnaire survey) was carried out within this paper.*
Results. *Most of the respondents assessed the intrasectoral cooperation as unsatisfactory and consider that the latest reform of the Public Health Service had a negative impact on it. The pandemic alert caused by the COVID-19 infection served as a catalyst to improve cooperation. The main barriers to collaboration are considered the lack of staff and insufficient communication, various viewpoints and lack of public health knowledge, an overlying complex legal framework and lack of motivation, which often requires central authority involvement.*
Conclusions. *Some barriers to cooperation can be overcome without any systemic changes and centralized involvement, while more easily achievable measures such as joint trainings are sufficient. Thus, understanding these aspects can greatly improve the interaction between services.*

Cuvinte cheie: *conlucrare intrasectorială, serviciul de Sănătate Publică, asistență medicală primară, bariere.*

CONLUCRAREA SERVICIUL DE SĂNĂTATE PUBLICĂ CU ASISTENȚA MEDICALĂ PRIMARĂ LA NIVEL TERITORIAL

Introducere. *Conlucrarea intrasectorială în domeniul sănătății publice reprezintă un potențial enorm de valorificare în cele trei sectoare fundamentale de sănătate publică: prevenirea îmbolnăvirilor, protecția și promovarea sănătății. Pandemia COVID-19 a influențat simțitor implicarea părților interesate, mai multe eforturi fiind depuse în prevenirea și controlul bolii.*
Material și metode. *Studiu mixt calitativ–cantitativ (interviuri în profunzime/sondajul pe bază de chestionar).*
Rezultate*. Majoritatea respondenților au apreciat conlucrarea intrasectorială ca nesatisfăcătoare și consideră că ultima reformă a Serviciului de Sănătate Publică a influențat-o negativ. Alerta pandemică provocată de infecția COVID-19 a servit drept catalizator pentru îmbunătățirea colaborării. Principalele bariere în conlucrarea eficientă sunt considerate lipsa de personal, comunicarea insuficientă, viziuni diferite și cunoștințe reduse în domeniul sănătății publice, cadrul legal prea complicat și motivarea nesatisfăcătoare, pentru înlăturarea cărora deseori este necesară implicarea managementului central.*
Concluzii. *Mai multe bariere în conlucrare pot fi depășite fără schimbări la nivel de sistem și implicări de la nivel central, fiind suficiente acțiuni mai ușor realizabile, cum ar fi instruirile comune. Cunoașterea acestor aspecte ar putea să contribuie la o îmbunătățire considerabilă a interacțiunii dintre servicii..*

INTRODUCTION

Successful cooperation in any field of activity can be provided through the rational and efficient use of resources. Therefore, it is very important that all activities are carried out professionally and in a team spirit in order to achieve the goals, by strengthening forces and promoting the right management strategy. Intrasectoral collaboration in public health represents a huge potential for optimizing the core actions within this area. The Public Health Service and Primary Health Care share common goals in the three main areas of public health: disease prevention, health protection and healthcare awareness. Although primary health care services focus primarily on the health of individuals, there has recently been a growing interest in discussing health issues at the population level (1 – 4), in fighting off the social determinants of health issues (5, 6), and in expanding methods for collaboration with other institutions, especially those related to public health, which, in turn, also show an increased interest in effective collaboration (7 – 12). For some activities, such as immunization or emergency preparedness, this cooperation shows a rather long history (13), but an increasing number of specialists in both services recognize the need to expand and deepen the relationships in terms of common health issues and develop skills sharing and partnership development strategies (14). According to specialized literature, effective collaboration may be influenced by institutional factors (common missions and visions, as well as outlined goals and objectives), factors influencing key partnership processes (transparency, stability, sustainability, implementation of performance evaluation strategies), factors affecting the possibility of cooperation (availability of common data and the ability to analyse them, the presence of specific social, economic or environmental factors), and factors that promote cooperative use of resources (15 – 22).

However, studies that have attempted to identify local barriers to collaboration between public health and primary health care are still scarce. Barriers identified to date include lack of communication and an agreed way of assessing or measuring collaboration between public health and primary health care (19). Recent studies have also identified other barriers to mutual collaboration, such as, reduced awareness, lack of communication and data exchange problems, low ability to deal with certain public health challenges, especially with regard to new issues, scarce resources (23), etc.

Further study of these issues will help understand how to improve cooperation between the Public Health Service and Primary Health Care.

Purpose of the study: to assess the intrasectoral collaboration practices between Public Health Service (PHS) and Primary Health Care (PHC) at the territorial level.

MATERIAL AND METHODS

To achieve the proposed objectives, a mixed qualitative and quantitative study (parallel triangulation study design) was carried out. The qualitative study included 14 in-depth interviews with the heads of public health and primary health care centers. The quantitative study involved a descriptive survey based on a questionnaire designed for the benefit of the study. Qualitative pre-testing of the questionnaire was conducted on a limited group of participants (no. 5), whose responses were not included in the final analysis. The minimum sample size was calculated taking into account the total number of specialists working in the corresponding institutions (available source: Statistical Yearbook of the 2020 Health System of Moldova included the error margin of 5%, a 1.5 design effect to ensure a 95% confidence interval, involving 634 specialists of the Public Health Service and Primary Health Care, including 10% of non-response rate. The invitations for participation and the questionnaire with informed consent were sent to the e-mail addresses of institutions randomly, which were selected from the list of the relevant above-mentioned institutions, which further engaged all the qualified employees in public health sectors or family doctors in completion of the survey. The inclusion criterion was the consent to participate in the study. SPSS ver.23 and Microsoft Excel were used to create and analyse the database. The obtained results are presented as a proportion (%) with standard error of the mean ($\pm SEm$). To compare the categorical data, the $\chi 2$ test was used, $p<0.05$.

RESULTS

After the data filtering procedure, 623 questionnaires were included in the analysis. Of the total number of survey participants, 63.1% were wo-

men, of which 85.2% had a work experience ≥10 years. General physicians showed little interest in the study's arguments, accounting for 42.2% of the expected number of participants. The comparative analysis of responses obtained from both groups showed no statistically significant differences ($p>0.05$).

About half or 52.0% (±2.0%) of the respondents confirmed the presence of some collaboration barriers, whereas lack of communication (approximately 2 out of 5 respondents) and insufficient staff engagement (approximately 1 out of 4 respondents) were found as the main occurring reasons at the territorial level. The rest of the participants indicated two or more concomitant reasons (fig. 1).

Generally, intrasectoral collaboration has been considered difficult due to several factors such as different visions in both sectors, motivational base, legal framework, and lack of knowledge in Public Health (fig. 2).

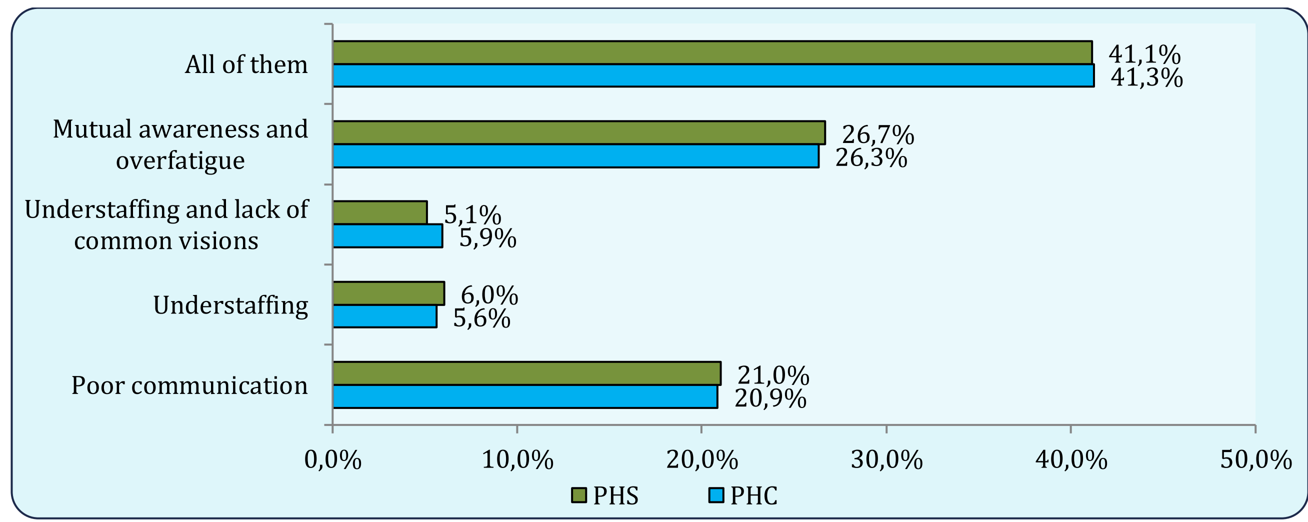

Figure 1. Perceived barriers to cooperation at the territorial level.

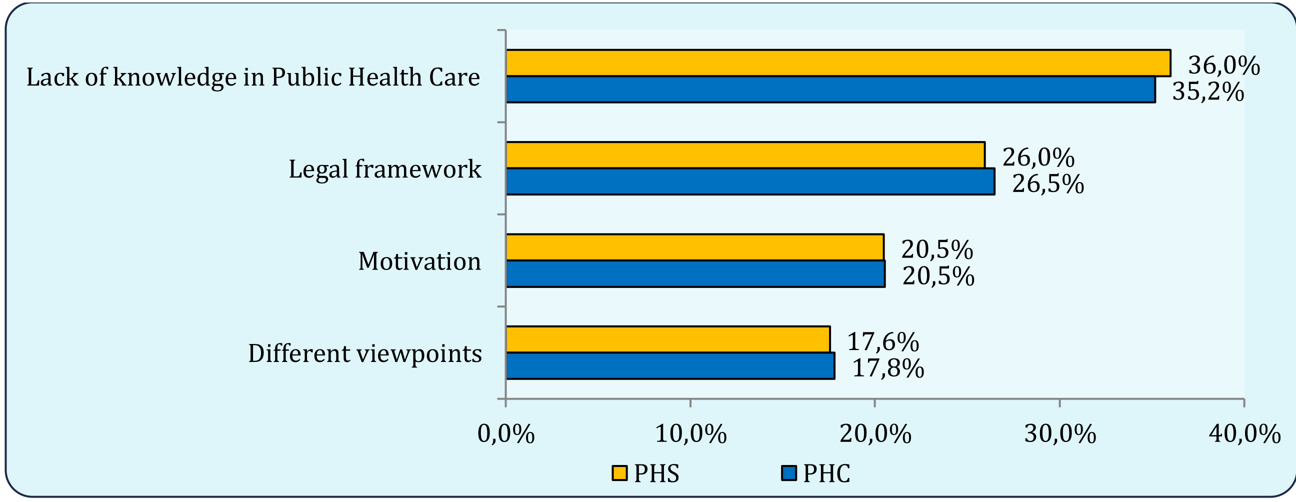

Figure 2. Factors complicating intersectoral collaboration at the territorial level.

Only 36.4% (±1.9%) of respondents think it is essential to amend some legislative/ regulatory acts that would bring clarity and improve cooperation in the future, and 88.9% (±1.3%) of respondents consider it necessary to organize joint trainings on intrasectoral cooperation. However, only 14.4% (±1.4%) of respondents reported that they had heard about the organization of this training method.

Around half or 49.8% (±2.0%) of the respondents consider that the involvement of the central authorities is necessary to remove the existing barriers. As regarding the coordination factor at the

territorial level, 22.5% of respondents think the District Council led by the District President (as the main link at the administrative territory level) should be involved in coordination, 20.9% of respondents – by the Extraordinary Public Health Commission, and 11.2% respondents – by the Commission for Emergency Situations. Only 4.3% of the respondents chose the Territorial Public Health Council as their answer, and 41.1% of the respondents consider that all of the above mentioned bodies should be involved in coordination.

Analysing the data obtained during the in-depth interviews, a series of barriers to collaboration between the Public Health Service and primary healthcare were identified. Thus, the managers assessed the territorial cooperation between these services as unsatisfactory, with a note that "there is room for improvement and that more openness and communication, involvement and dedication from both sides are required". It is also generally agreed that the last reform of the Public Health Service (dated in 2018) on the creation of the National Agency for Public Health with 10 territorial Public Health Centres had actually a negative impact on the administrative territories related to the territorial Public Health Center. Almost all respondents stressed that the COVID-19 pandemic alert has led to increased participation and acted as a catalyst for improved intrasectoral collaboration. For example, since the pandemic onset, cooperation between the two services has increased significantly. Joint efforts have been made in several areas, such as the COVID vaccination campaign, followed by staff training, provision of vaccines and equipment to maintain the local cold supply chain, and the development of the National Vaccination Registry with real-time monitoring of the immunization process, in particular, the joint organization of information campaigns among the population to increase the vaccine acceptability and awareness on the benefits of vaccinations. However, the vast majority of respondents agreed that the results could have been much better if cooperation had not been hampered by some external and internal factors. Almost all participants in the study found the current legal framework too complex, as there are too many overlapping regulations and the fast speed to which they modify.

In order to improve intrasectoral cooperation, the following solutions were indicated as necessary: promoting openness on both sides, organization of joint trainings, optimizing communication, staff and equipment provision in accordance with specific needs, and funding at the same level, etc.

DISCUSSIONS

The analysis of the specialized literature revealed that there is a limited number of studies in this field, especially regarding the barriers in local collaboration between public health and primary healthcare institutions.

Moreover, a consensus was also found on the results obtained in terms of intrasectoral collaboration and the identified barriers. For example, similar results were obtained in a US 4-state multicenter study, which studied the increased interest in collaboration between these services to enhance community health. Thus, despite the increased understanding on how these collaborations work, little is known about the barriers occurring at the territorial level (24). This study found that primary care providers and public health specialists report similar barriers to collaboration. Thus, barriers at the institutional level included problems in the primary health care settings, where providers feel overwhelmed and where resources are limited, the need for systemic change, lack of partnership, and geographic challenges. Barriers to collaboration included lack of mutual awareness, difficulties in communication and data exchange, weak institutional capacity, failure and the need to optimize the available resources.

Determining the similarities between the study results and those from international studies, as well as learning the prior lessons by identifying some aspects of the local framework, could help improve the intersectoral collaboration for quality, continuity, sustainability and development.

CONCLUSIONS

1. In the course of the study, it was found that the cooperation between the Public Health Service with primary healthcare is unsatisfactory, due to a series of territorial barriers.
2. The study participants consider that the latest reform of the Public Health Service had a negative impact on intrasectoral collaboration, as well as on primary healthcare settings.

3. The pandemic alert caused by the COVID-19 infection led to a more active involvement and was a catalyst for an enhanced intersectoral collaboration.
4. The study results identified a series of major barriers in the collaboration between the services under study, namely, different visions and insufficient knowledge regarding public health, the deficient legal framework, inadequate staffing, and lack of initiative and common priorities.
5. The study determined that to overcome these barriers and provide a more effective collaboration, the involvement of central authorities is needed, and that cooperative working conditions, motivation, responsibilities, and joint trainings should be provided at the administrative-territorial level.
6. The obtained results suggest that while some barriers to collaboration (such as the legal framework, the motivational framework, and funding) require systemic change to be overcome, others (such as providing a common vision, communication, mutual awareness) could be overcome through joint training without any additional resources. Further study of these issues will help understand how best to support collaboration between the Public Health Service and Primary Health Care.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

ETHICAL APPROVAL

The research was conducted under strict conditions of anonymity and carries no ethical risks. The approval of the research ethics committee was not required.

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REFERENCES

1. Etz RS, Gonzalez MM, Brooks EM, Stange KC. Less AND more are needed to assess primary care. *J Am Board Fam Med*. 2017;30(1):13-15.
2. Prunuske J, Chang L, Mishori R, Dobbie A, Morley CP. The extent and methods of public health instruction in family medicine clerkships. *Fam Med*. 2014;46(7):544-548.
3. Washington AE, Coye MJ, Boulware LE. Academic health systems' third curve: population health improvement. *JAMA*. 2016;315(5):459-460.
4. Koh HK, Tavenner M. Connecting care through the clinic and community for a healthier America. *Am J Prev Med*. 2012;42(6 suppl 2):S92-S94.
5. DeVoe JE, Bazemore AW, Cottrell EK, et al. Perspectives in primary care: a conceptual framework and path for integrating social determinants of health into primary care practice. *Ann Fam Med*. 2016;14(2):104-108.
6. Maxwell M, Hibberd C, Pratt R, Cameron I, Mercer S. *Development and Initial Validation of the Minnesota Edinburgh Complexity Assessment Method (MECAM) for Use Within the Keep Well Health Check*. Edinburgh, Scotland: NHS Health Scotland, 2011.
7. Garg A, Sandel M, Dworkin PH, Kahn RS, Zuckerman B. From medical home to health neighborhood: transforming the medical home into a community-based health neighborhood. *J Pediatr*. 2012;160(4):535-536.e1.
8. Martin LT, Plough A, Carman KG, Leviton L, Bogdan O, Miller CE. Strengthening integration of health services and systems. *Health Aff (Millwood)*. 2016;35(11):1976-1981.
9. Brandt AM, Gardner M. Antagonism and accommodation: interpreting the relationship between public health and medicine in the United States during the 20th century. *Am J Public Health*. 2000;90(5):707-715.
10. Mays GP, Halverson PK, Stevens R. The contributions of managed care plans to public health practice: evidence from the nation's largest local health departments. *Public Health Rep*. 2001;116(suppl 1):50-67.
11. Rowan MS, Hogg W, Huston P. Integrating public health and primary care. *Healthc Policy*. 2007;3(1):e160-e181.
12. Scutchfield FD, Michener JL, Thacker SB. Are we there yet? Seizing the moment to integrate medicine and public health. *Am J Prev Med*. 2012;42(6 suppl 2):S97-S102.
13. Levesque J, Breton M, Senn N, Levesque P, Bergeron P, Roy DA. The interaction of public health and

primary care: functional roles and organizational models that bridge individual and population perspectives. *Public Health Rev*. 2013;35(1):14.
14. Welter CR, Jacobs B, Jarpe-Ratner E, Naji S, Gruss K. Building capacity for collective action to address population health improvement through communities of practice: a distance-based education pilot. *Pedagog Health Promot*. 2017;3(1 suppl):21S-27S.
15. Prybil L, Scutchfield FD, Killian R, et al. *Improving Community Health Through Hospital-Public Health Collaboration: Insights and Lessons Learned From Successful Partnerships*. Lexington, KY: Commonwealth Center for Governance Studies, Inc; 2014.
16. Michener JL, Koo D, Castrucci BC, Sprague JB, eds.*The Practical Playbook: Public Health and Primary Care Together*. New York, NY: Oxford University Press; 2016.
17. Bryson JM, Crosby BC, Stone MM. The design and implementation of cross-sector collaborations: propositions from the literature. *Public Adm Rev*. 2006;66(1):44-55.
18. Lebrun LA, Shi L, Chowdhury J, et al. Primary care and public health activities in select US health centers: documenting successes, barriers, and lessons learned. *Am J Prev Med*. 2012;42(6 suppl 2):S191-S202.
19. Jacobson DM, Teutsch S. An environmental scan of integrated approaches for defining and measuring total population health by the clinical care system, the government public health system, and stakeholder organizations. Available from: http://www.improvingpopulation-health.org/PopHealthPhaseIICommissionedPaper.pdf [Accessed September 12, 2022].
20. Porterfield DS, Hinnant LW, Kane H, Horne J, McAleer K, Roussel A. Linkages between clinical practices and community organizations for prevention: a literature review and environmental scan. *Am J Prev Med*. 2012;42(6 suppl 2):S163-S171.
21. Dymek C, Johnson M, Jr, Mardon R, et al. *Clinical-Community Relationships Measures Atlas*. Rockville, MD: Agency for Healthcare Research and Quality; 2013.
22. Shah GH, Leider JP, Castrucci BC, Williams KS, Luo H. Characteristics of local health departments associated with implementation of electronic health records and other informatics systems. *Public Health Rep*. 2016;131(2):272-282.
23. Valaitis RK, O'Mara L, Wong ST, MacDonald M, Murray N, Martin-Misener R, Meagher-Stewart D. 2018. Strengthening primary health care through primary care and public health collaboration: the influence of intrapersonal and interpersonal factors. *Primary Health Care Research & Development* 2018;19:378-391 doi:10.1017/S1463423617000895
24. Pratt R, Gyllstrom B, Gearin K, Lange C, Hahn D, Baldwin LM, VanRaemdonck L, Nease D, Zahner S. Identifying Barriers to Collaboration Between Primary Care and Public Health: Experiences at the Local Level. *Public Health Rep.* 2018;133(3):311-317. doi: 10.1177/0033354918764391

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Oleg LOZAN, SCOPUS ID: 57211988601

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MEDICAL SCIENCES

DIGITAL SOCIAL LISTENING IN COVID-19 PANDEMIC FOR INFORMED INTERVENTIONS IN THE REPUBLIC OF MOLDOVA: INTEGRATED DATA

Alina TIMOTIN, Adriana PALADI, Valentin MITA, Valeria CHIHAI, Oleg LOZAN

School of Public Health Management, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Corresponding author: Alina Timotin, e-mail: alina.timotin@usmf.md

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Keywords: *infodemic, COVID-19, Social Listening, report, COVID-19 interventions.*

Introduction. *Social Listening is a suitable tool used in monitoring and controlling the infodemic, a phenomenon that has exacerbated the global public health crisis generated by the COVID-19 pandemic.*

The purpose of the study. *Digital monitoring of public perceptions of the COVID-19 in the Republic of Moldova, evaluating the temporal sequence of message content on social media to understand and inform decision-makers on the necessary actions based on needs/problems.*

Material and methods. *The Talkwalker software, developed for marketing research, has been adapted to the study objective by creating a search syntax for COVID-19. The taxonomy for COVID-19 conversations developed and validated by Purnat et al. was taken into account.*

Results. *Between 01.01-30.11.2022, 18000 results were shared. Interest is expressed through a downward fluctuating curve, the highest audience engagement rate being generated by the Unica.md post regarding the French authorities' decision to waive restrictions (2400 shares, over 155 thousand likes, 521 comments). The aggregate sentiment of netizens is predominantly neutral and negative, dominated by anger and fear.*

Conclusions. *It is observed that the population shows distrust regarding the reality of the pandemic, being reserved towards actions taken by authorities to counter the pandemic, and/or conspiratorial beliefs, which indicate the presence of falsehoods in social media and the need for targeted responses from authorities to increase the population's resistance to misinformation.*

Cuvinte-cheie: *infodemie, COVID -19, dezinformare, „social listening", raport, intervenții în COVID-19.*

„SOCIAL LISTENING" DIGITAL ÎN PANDEMIA COVID-19 PENTRU INTERVENȚII DE INFORMARE ÎN REPUBLICA MOLDOVA: DATE INTEGRATE

Introducere. *„Social listening" este un instrument propice utilizat în monitorizarea și în controlul „infodemiei", fenomen care a agravat criza globală de sănătate publică, generată de pandemia COVID -19.*

Scopul studiului. *Monitorizarea digitală a percepțiilor publice privind COVID-19 în Republica Moldova, evaluarea pe secvențe temporale a conținutului mesajelor din rețelele sociale pentru a înțelege și informa factorii de decizie privind acțiunile necesare țintite pe nevoi/probleme.*

Material și metode. *Soft-ul Talkwalker, elaborat pentru cercetări de marketing, a fost adaptat la obiectivul studiului prin crearea sintaxei de căutare privind COVID-19. S-a ținut cont de taxonomia pentru conversațiile COVID-19, elaborată și validată de Purnat et al.*

Rezultate. *Între 01.01-30.11.2022, au fost partajate 18 mii de rezultate. Interesul este exprimat printr-o curbă fluctuantă descendentă, rata cea mai mare de implicare a audienței fiind generată de postarea Unica.md privind decizia autorităților franceze de a renunța la restricții (2400 distribuiri, peste 155 mii de aprecieri, 521 de comentarii). Sentimentul agregat al internauților este preponderent neutru și negativ, dominat de mânie și teamă.*

Concluzii. *Se constată neîncrederea populației privind realitatea pandemiei, reticență față de acțiunile autorităților pentru contracararea pandemiei sau/și viziuni conspiraționiste, ceea ce denotă prezența falsurilor în conținuturile difuzate pe rețelele sociale și nevoia de răspunsuri țintite ale autorităților pentru creșterea rezistenței populației la dezinformare.*

INTRODUCTION

The COVID-19 pandemic has created a global public health crisis, exacerbated by the lack of prompt scientific information at its onset regarding the causes of the disease, mode of transmission, prevention measures, necessary treatment, etc., and the simultaneous falsehoods occurrence, which rapidly were distributed (with or without malicious intent) in communities through various sources of information. The proliferation of media sources, particularly online (social media), has catalysed the phenomenon of the general increase in the volume of information, but in the COVID-19 pandemic, it has facilitated the spread of false information to unprecedented levels. The phenomenon of an overabundance of information (both correct and incorrect) from online and offline sources that accompanies an epidemic or another health crisis has conceptually consolidated in the term "infodemic" (1).

The consequences of infodemic are many and alarming. At the community level, it leads to the polarization of opinion, distortion of the interpretation of scientific evidence, promotion of fear and panic, increased mental and physical exhaustion of the population, increase in conspiratorial beliefs, decreased trust in governments and public health systems, as well as in the accuracy of official health messages. Within the healthcare system, infodemics can lead to the misallocation of resources and increased stress among healthcare providers, decreased access to medical care, conspiratorial beliefs, delayed delivery of high-quality care and proper treatment to patients, and more (2, 3).

Particularly, the abundance of information causes confusion and uncertainty regarding the risks of the disease and the benefits of protection/prevention measures, and subsequently, negative attitudes/perceptions and hesitant behaviors towards the interventions initiated by authorities to reduce the impact of the pandemic. The important role of risk perception and the benefits of health interventions and the adoption of healthy behaviors in communities have been demonstrated by multiple studies, including those related to communication and behavioral factors in vaccine hesitancy (4, 5, 6).

Based on the above, monitoring the infodemic for the benefit of public health becomes an imperative and a challenge of our time. The World Health Organization, together with other international organizations such as UNICEF, Gavi, the Vaccine Alliance, etc., have made efforts to strengthen community capacities globally in the fight against the infodemic (7, 8, 9), including by popularizing and promoting social listening tools conducive to achieving this objective (10).

Digital "social listening" techniques make it possible to quickly process and analyses a large amount of information regarding the questions, concerns, feelings, narratives (opinions), perceptual errors (level of misinformation) of the population, as well as information gaps and outdated or distorted information on social media platforms. Based on these analyses, reports can be created to provide timely and relevant data for targeted, appropriate interventions to shape healthy behaviors, promote the resilience of these behaviors, and develop community engagement with public health strengthening actions.

In this context, our goal is the digital monitoring of public perceptions regarding the COVID-19 pandemic, the evaluation over temporal sequences of the content of messages on social media in order to understand and inform decision-makers regarding targeted actions on needs/problems that need to be implemented.

MATERIAL AND METHODS

Digital monitoring of public perceptions regarding the COVID-19 pandemic was carried out using the Talkwalker software. This tool, primarily designed for marketing research, was adapted to the study's objective by creating syntaxes for searching on COVID-19 topics. Thus, using Boolean search operators (AND, OR, and NOT), key words and phrases (such as virus, COVID, vaccination, childhood vaccination, misinformation, etc.) were combined to establish and limit the search to a well-defined research's area of interest. In establishing the search syntax for COVID-19 information, the taxonomy for COVID-19 conversations in social listening *developed and validated* by Purnat et al. (11) was taken into account: Cause (virus cause, stigma surrounding the spread, spread and immunity); Disease (confirmed symptoms, other discussed symptoms, asymptomatic transmission, pre-symptomatic transmission, modes of transmission, protection against transmission, risks, vulnerable individuals/communi-

ties, restrictions, myths); Treatment (current treatment, research and development, unproven treatment, context: nutrition, myths); Vaccination (vaccine types, efficacy, side effects/safety, number of doses, contraindications); Misinformation (mischaracterization of the disease or protective measures, false treatments, conspiracy theories, sources and influencers, most engaging information, statistics and data); Interventions (testing, supportive care, personal measures, measures in public spaces, travel).

The software was also adjusted to the local specificities of the country by setting the health information channels (official pages of important health institutions, such as the Ministry of Health, the National Public Health Agency, *Nicolae Testemitanu* State University of Medicine and Pharmacy, the National Health Insurance Company, UNICEF, etc.) and information sources (types of mass media and social media alike).

Between January 2022 and November 2022, using the adjusted software, data was collected and analyzed from social platforms and forums. Monthly reports were compiled highlighting the most interesting trends and useful information regarding the number of posts related to COVID-19 (according to the established syntax), the *engagement* for each post (the number of likes, shares, and comments on the post), the *potential reach* — estimated number of people who can access the post/information, public sentiment regarding the information, influencers, the profile of internet users, the messages conveyed by internet users, and other related factors. Based on the analyzed data, recommendations were developed for actions aimed at adjusting the population's perceptions, attitudes, and behaviors. This article presents the integrated (synthesized) results of the study obtained over the entire duration of the research.

RESULTS

Fluctuation of interest on COVID-19 topic

During 01 January - 30 November 2022, 18 thousand posts (results) regarding COVID-19 were shared, structured in descending order according to the engagement rate per post. Interest in this topic during the studied period shows a fluctuating curve, with several moments of increased interest (4 peaks) in the time intervals: 07.02.2022-14.02.2022; 21.03.2022-27.03.2022; 16.05.2022-22.05.2022; 01.08.2022-07.01.2022. There is also a tendency of a slow but constant decrease in internet users' interest towards the topic (fig. 1).

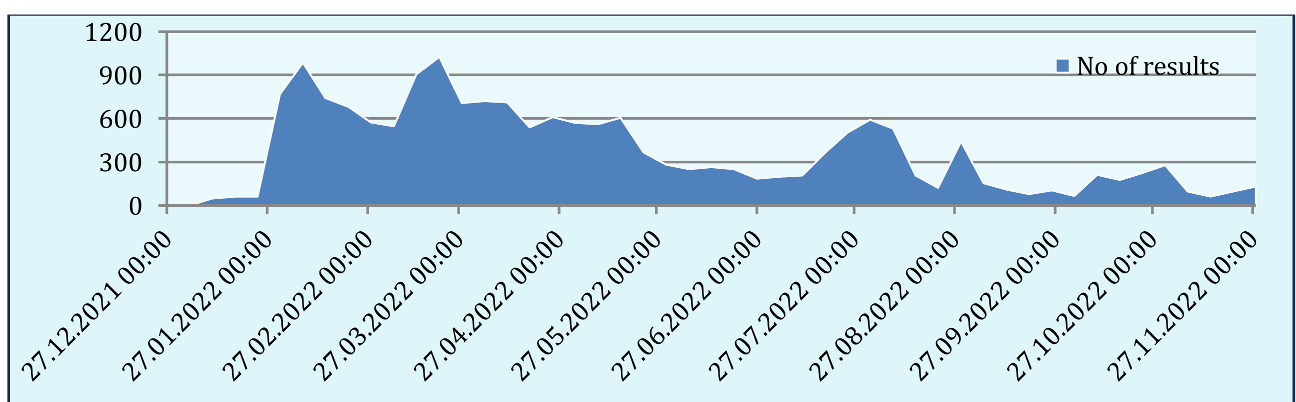

Figure 1. Results over time.

During 7 February 2022 - 14 February 2022, (the first peak) 994 posts were recorded. The information with the highest engagement rate was the post from WHO regarding the disruption of the children's vaccination schedule during the COVID-19 pandemic and the call for the population to catch up on missed vaccines. The message had a potential reach of 14900 and an engagement rate of 77 interactions (the message was shared 36 times and liked 43 times), with a neutral emotional reaction.

In the period of 21 March 2022 - 27 March 2022 (the second peak) 1000 results were recorded. Several news items presented high interest. The first news item posted by the WHO was about the meeting between the WHO Regional Director for Europe and the President of the Republic of Moldova, during which, support was provided by the WHO on the COVAX platform for the prioritized distribution of COVID-19 vaccine in the Republic

of Moldova. The message had a potential audience of 14,900 people, generated 139 interactions (engagement: likes – 127, shares – 10, comments – 2), and registered a positive emotional reaction. The second news item referred to a message issued by Jurnal.md, stating that Moderna is set to seek emergency authorization for vaccinating children under the age of six for protection against the coronavirus. The potential audience of the post was 180600 people, and the engagement rate was 53 (9 shares, 8 likes, and 36 comments). Although the software qualifies the reaction to the message as neutral, an analysis of the comments reveals an evident negative feeling. The message “Hands off children, you scoundrels” received the most likes (22 in total), while “Take your hands off children” received 20 likes. During the same period, TV8.md reported that mobile vaccination points are no longer as popular as they used to be, and doctors say that the flow of people wishing to be immunized has decreased significantly. The message had a potential target audience of 178600 people and 20 interactions (engagement: 14 likes, 5 comments, and 1 share). The software qualifies the sentiment to the message as neutral, but the comments remained negative as related to the interventions of the authorities: “It was a stupid idea from the beginning. They want to control the population”.

In the period of 16 May 2022 - 22 May 2022 (the third peak), the interest decreases by almost two times, with only 609 posts recorded. The news with the highest engagement is the message from the WHO regarding the launch of the vaccination process intensification campaign in Straseni. The campaign was launched by the Ministry of Health in collaboration with the National Agency for Public Health, with the support of the WHO and the EU, in the presence of high-ranking officials. The potential reach of the message was 14900 people, and the engagement rate was 141 people (116 likes, 20 shares, and 5 comments). The sentiment of the message was neutral, and the comments were negative towards the authorities and the vaccine. “My personal conclusions regarding the invention of COVID-19 and COVID vaccination: 1. The undermining of humanity’s supreme reason on Earth and the covert or hidden control of vaccinated individuals according to the principle written by the number: 666 of Satan...” however, the message did not receive any likes.

In the period of 1 August 2022 - 7 January 2022 (the fourth peak), 610 results were recorded. The post with the highest engagement was launched by the WHO and refers to promoting a proactive attitude towards vaccination by telling the story and opinion of a nurse who, being responsible for administering the second dose of the COVID-19 vaccine booster, encourages the public to get vaccinated. A total of 167 people showed engagement towards the post (including 15 shares, 128 likes, and 24 positive comments about the character of the post, most of which apparently came from the person’s close circle). The potential reach for the message was 15000 people, and the sentiment towards the message was qualified as neutral.

Engagement or reactions to the topic

Engagement is a term that refers to taking a stance (involvement) or interaction/reaction of internet users to posted messages. In the analysed period, the engagement towards posts regarding COVID-19 amounts to 38500 shares, likes, and comments. The intensity of the recorded engagement is relatively uniform and low with only one significant increase throughout the year (fig. 2).

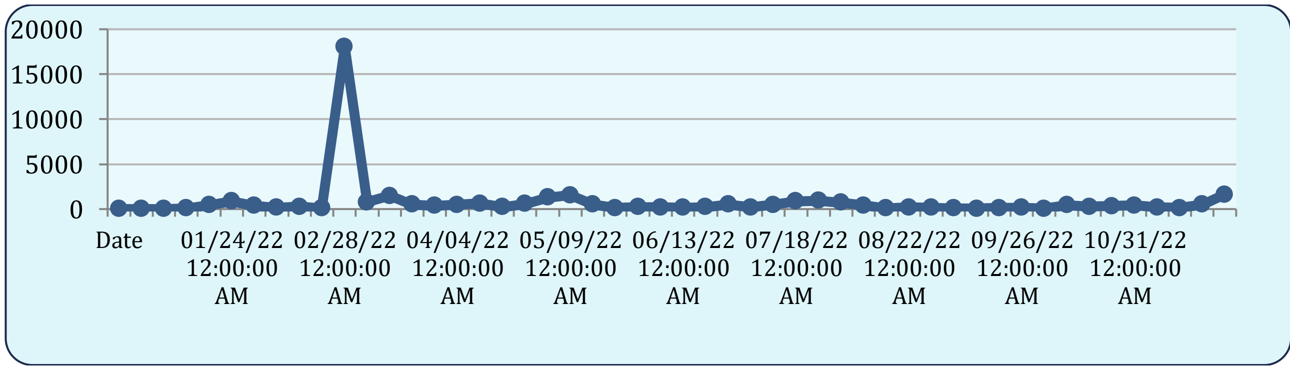

Figure 2. Engagement over time.

The increase in engagement intensity is recorded in the period of 28.02.2022-06.03.2022 and is related to the publication made by Unica.md regarding the decision of the French authorities to cease the enforcement of vaccine passports and protective masks. About 17500 people showed interest in this news, which represents almost half of all reactions/interactions recorded in a year. The news was shared 2400 times, received likes from 15100 internet users, and was commented on 521 times. The message with the most likes (183 likes) was: *"2 years of theatre have ended, they got bored and lifted COVID restrictions. Now we have a war on stage and played very, let's see what's next. Only one thing is certain, we are simple people who lose our lives, our loved ones, our homes and are forced to leave the country. Cursed be you, LEADERS OF COUNTRIES, who play dirty games and kill innocent people and children for your own goals"*.

Influential sources of information (top influencers)

Influencers are active authors or websites with a large potential reach and whose posts generate high-intensity engagement (with multiple interactions) and therefore have the potential to shape the opinions and behaviors of the population. During the studied period, the Unica.md Facebook page is qualified by the Talkwalker software as the most *influential* author (with an engagement of 18300), while News.yam.md is the most *active* author and site (having 1400 posts).

Table 1. Top influencers for Facebook.

Facebook Influencer	Rank	Posts				Potential Reach	Reach per Result	Engagement	Engagement per Result
		Total	Positive	Neutral	Negative				
Unica.md	4	57	3	43	11	7456718	130819.61	18293	320.93
WHO in Moldova	1	79	18	59	2	1184483	14993.46	7417	93.89
Realitatea.md	7	55	1	48	6	4037541	73409.84	484	8.80
TV6 MD	2	62	0	43	19	1974568	31847.87	417	6.73
Ea.md	3	57	1	40	16	4550592	79834.95	196	3.44
TVR Moldova	5	56	0	48	8	2837439	50668.55	156	2.79
Unimedia	9	43	0	30	13	4526669	105271.37	92	2.14
Radio Chisinau	6	55	1	45	9	629053	11437.33	54	0.98
ZUGO	10	42	0	31	11	1901707	45278.74	17	0.40
ORHEI TV	8	46	0	37	9	330743	7190.07	10	0.22

The most intense interactions of internet users are recorded on the social media platform Facebook. The top *influencers* with posts on this site (following the sequence outlined in tab. 1, according to the level of *Engagement*) are: Unica.md, World Health Organization in Moldova, TV8.md, JurnalTV.md, and UNICEF Moldova. The table provides information on the following for each source: the total number of posts; the aggregated sentiments; the general and result-specific potential reach; the cumulative and per-post engagement.

Sentiment analysis on the topic of COVID-19

Social media sentiment refers to the emotion or attitude people express on social media about a particular message, topic, or post (12). Sentiment analysis in "digital social listening" is an automated process of attaching sentiments to the processed text in general terms of positive, negative or neutral polarity, but also in terms specific to the concrete type of emotion.

Regarding the topic of COVID-19, during the analyzed period, the aggregated sentiment of internet users is predominantly neutral and negative (fig. 3), with data distributed as follows: neutral sentiment – 78.8% of posts; negative sentiment – 15.4%; positive sentiment – 5.9%. In specific terms: 4100 posts express anger; 2200 – fear; 1800 – sadness; 1200 – love; 668 – joy; 20 – sur-.

prise. The net sentiment score (NSS, calculated by subtracting the percentage of negative sentiment from the percentage of positive sentiment) is negative – 44.6%.

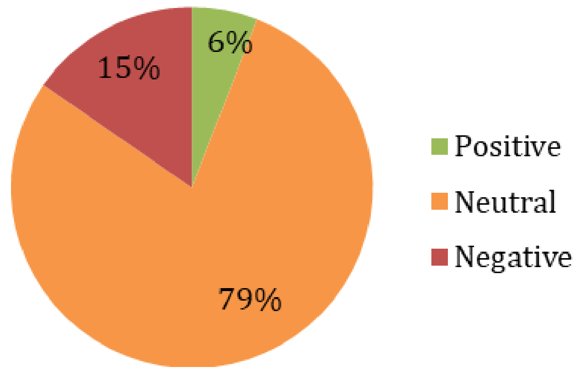

Figure 3. Share of sentiment (*Talkwalker).*

The social demographic profile of internet users

The profile of internet users is outlined through the analysis of the following independent variables: gender, age, spoken language, marital status, interests, occupational status, etc. According to gender, 44.3% of internet users are women and 55.7% are men. By age categories, the data is distributed as follows: 20.5% of internet users are 18-24 years old; 66% are 25-34 years old; 10.2% are 35-44 years old; 3% are 45-54 years old; 0.3% are 55-64 years old; and no person is 65+. According to marital status, internet users are classified into 3 categories: parents – 76.9%; married – 21.5%; solitary – 1.6%. Regarding spoken language: 79.6% are Romanian speakers; 3.2% are Russian speakers; 17.2% – other languages. Most internet users express personal opinions (84%) and only 16% share posts on behalf of affiliated companies/organisations.

DISCUSSIONS

In the study, it was found that online messages are critical and distrustful of pandemic health protection measures, vaccination, and authorities in general. The health interventions of authorities are perceived as inventions intended for controlling and manipulating the population and vaccination is seen as "a means of making money", which presents clear signs of misinformation and false attitudes typical of the infodemic. Public trust is an important factor in the effective implementation of safety measures in public health crises. Acceptance of prevention measures, including vaccination, depends on the public's trust in the safety and effectiveness of these measures, trust in the healthcare system, healthcare professionals, etc. (13, 14).

Neutral sentiments, which are a priority in this study, can arise from the need for emotional detachment caused by the fatigue associated with the uncontrollable nature of the pandemic and the resulting uncertainty (15). At the same time, both negative and neutral sentiments marking the messages of Internet users are predictors/indicators of negative attitudes and hesitant behaviors. Information about threats and the fear generated thereby lead to avoidance and reduce intentions to adopt recommended protective behavior (16).

Taking into account that emotional responses to the pandemic are inevitable, and that emotions can make the population more susceptible to distorted information, it is necessary to develop and implement targeted strategies based on the needs of the population in public health crises (17).

Some recommendations for developing such strategies would be: (1) Promoting a single source for verifying information about COVID-19 (e.g. www.covidinfo.gov.md); (2) Strengthening a fact-checking platform for health information; (3) Forming teams to combat misinformation; (4) Developing partnerships between health authorities and media institutions; (5) Increasing trust in authorities, including through assertive communication strategies; (6) Promoting information that would lead to a positive attitude towards COVID-19 vaccination; (7) Using opinion leaders; (8) Diversifying accurate information offered to national minorities in different languages; (9) Building resistance to misinformation by developing internet users' competencies; (10) Using Social Listening reports to adjust communication strategies.

CONCLUSIONS

1. The population's interest in the COVID-19 topic is constantly decreasing and is characterised by a weak intensity of interactions (engagement) per post, which corresponds to a decrease in the intensity of the pandemic as a public health problem.

2. The net sentiment score of the population regarding the topic of COVID-19 is negative, with a dominance of the emotion of anger.
3. Some of the posts with a high level of engagement express distrust regarding the reality of the pandemic, reluctance towards the actions taken by authorities to counter the pandemic, and/or conspiracy theories, which indicate the presence of falsehoods on social media and the need for targeted responses from authorities to increase the population's resistance to misinformation.
4. The phenomenon of infodemic in public health crises is very complex, and in order to address it at the national level, long-term communication strategies are needed.
5. In the context of the limitations observed in this study, it would be beneficial to combine future digital analyses of public opinions on public health topics with data from complementary research (such as KAP studies, offline population dialogues, observational qualitative studies, etc.).

LIMITATIONS

The present study has several limitations:

The study gathered the opinions of those who are active on social media platforms, predominantly those aged 18-34, therefore not taking into account the voices of the entire population. At the same time, the opinions of people with limited access to social media (usually classified as vulnerable individuals) are not known. According to World Bank data, 76% of the country's population has access to the Internet (18).

Other limitations are related to the privacy policies of social media platforms, which restrict access to posts with private content (including closed groups), therefore only public posts were analysed in the study.

A particular suspicion is determined by the accuracy of evaluating internet users' sentiments. Some of the automated assessments made by the software did not correspond with the researchers' assessments, which is why sentiment assessments were sometimes done manually.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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ETHICAL APPROVAL

Ethical approval was not required.

REFERENCES

1. World Health Organization. Social Listening: Finding the Signal Through the Noise. Accessed November 21, 2022. Available from: https://www.gavi.org/sites/default/files/2021-06/Finding-the-Signal-Through-the-Noise.pdf [Accessed: November 21, 2022].
2. Borges do Nascimento IJ, Pizarro AB, Almeida JM, Azzopardi-Muscat N, Gonçalves MA, Björklund M, Novillo-Ortiz D. Infodemics and health misinformation: a systematic review of reviews. *Bull World Health Organ*. 2022;100(9):544-561. doi:10.2471/BLT.21.287654
3. Islam MS, Sarkar T, Khan SH, Mostofa Kamal AH, Hasan SMM, Kabir A, Yeasmin D, et al. COVID-19-Related Infodemic and Its Impact on Public Health: A Global Social Media Analysis. *Am J Trop Med Hyg*. 2020;103(4):1621-1629. doi:10.4269/ajtmh.20-0812
4. Brewer NT, Chapman GB, Rothman AJ, Leask J, Kempe A. Increasing Vaccination: Putting Psychological Science Into Action. *Psychol Sci Public Interest*. 2017;18(3):149-207. doi:10.1177/1529100618760521
5. Brewer NT. What Works to Increase Vaccination Uptake. *Acad Pediatr*. 2021;21(4S):S9-S16. doi:10.1016/j.acap.2021.01.017
6. Mowbray F, Marcu A, Godinho CA, Michie S, Yardley L. Communicating to increase public uptake of pandemic flu vaccination in the UK: Which messages work? *Vaccine*. 2016;34(28):3268-74. doi:10.1016/j.vaccine.2016.05.006

7. World Health Organisation public health research agenda for managing infodemics. Available from: https://www.who.int/publications/i/item/9789240019508 [Accessed: November 21, 2022].
8. World Health Organisation ad-hoc online consultation on managing the COVID-19 infodemic. Available from: https://www.who.int/teams/risk-communication/infodemic-management/who-ad-hoc-online-consultation-on-managing-the-covid-19-infodemic [Accessed: November 21, 2022].
9. World Health Organisation 4th Virtual Infodemic Management Conference: Advances in Social Listening for Public Health. Available from: https://www.who.int/news-room/events/detail/2021/05/04/default-calendar/4th-virtual-who-infodemic-management-conference-advances-in-social-listening-for-public-health [Accessed: November 21, 2022].
10. World Health Organisation launches pilot of AI-powered public-access social listening tool. https://www.who.int/news-room/feature-stories/detail/who-launches-pilot-of-ai-powered-public-access-social-listening-tool [Accessed: November 21, 2022].
11. Purnat TD, Vacca P, Czerniak C, Ball S, Burzo S, Zecchin T, et al. Infodemic Signal Detection During the COVID-19 Pandemic: Development of a Methodology for Identifying Potential Information Voids in Online Conversations. *JMIR Infodemiology.* 2021;1(1):e30971. doi:10.2196/30971
12. Boiy et al. Automatic Sentiment Analysis in Online Text. Proceedings of the 11th International Conference on Electronic Publishing Vienna. 2007. Vienna University of Technology (Vienna, Austria). Available from: https://elpub.architexturez.net/system/files/pdf/138_elpub2007.content.pdf [Accessed: November 23, 2022].
13. Heidi J. Larson, Richard M. Clarke, Caitlin Jarrett, Elisabeth Eckersberger, Zachary Levine, Will S. Schulz, at al. Measuring trust in vaccination: A systematic review. *Human Vaccines & Immunotherapeutics.* 2018;14(7):1599-1609. doi:10.1080/21645515.2018.1459252
14. Latkin CA, Dayton L, Yi G, Konstantopoulos A, Boodram B. Trust in a COVID-19 vaccine in the U.S.: A social-ecological perspective. *Soc Sci Med.* 2021;270:113684. doi:10.1016/j.socscimed.2021.113684
15. Morgul E, Bener A, Atak M, Akyel S, Aktaş S, Bhugra D, et al. COVID-19 pandemic and psychological fatigue in Turkey. *International Journal of Social Psychiatry*. 2021. doi:10.1177/0020764020941889
16. Eppright D.R, Hunt J.B, Tanner J.F, Franke G.R. Fear, coping, and information: A pilot study on motivating a healthy response. *Health Marketing Quarterly.* 2002;20(1):51-73. doi:10.1300/J026v20n01_05
17. Chou WYS, Budenz A. Considering Emotion in COVID-19 Vaccine Communication: Addressing Vaccine Hesitancy and Fostering Vaccine Confidence. *Health Communication.* 2020;35:14:1718-1722. doi:10.1080/10410236.2020.1838096
18. The World Bank Data. Available from: https://data.worldbank.org/indicator/IT.NET.USER.ZS?end=2017&locations=MD&start=2016 [Accessed: November 25, 2022].

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Oleg LOZAN, SCOPUS ID: 57211988601

EVENTS/ANNIVERSARIES – ÉVÉNEMENTS/ANNIVERSAIRES

O FIGURĂ PROEMINENTĂ A ÎNVĂȚĂMÂNTULUI SUPERIOR MEDICAL DIN REPUBLICA MOLDOVA

Omul este fericit când poate realiza ceea ce prin natura sa este destinat să realizeze, iar acest lucru înseamnă, dincolo de determinările exterioare, să-şi îndeplinească datoria prescrisă de imperativul raţiunii. Esenţa fericirii este determinată...

(Aristotel)

Talentul şi erudiţia, obiectivitatea şi exigenţa, curajul şi tenacitatea, pasiunea şi dăruirea de sine sunt doar câteva dintre calităţile ce conturează pregnant imaginea Profesorului Grigore Friptuleac.

Domnul Profesor Grigore Friptuleac este un exemplu viu de dedicație profesională și de perseverență, precum și o confirmare univocă a faptului că efortul continuu se încununează cu succes.

Temelia caracterului și personalității reputatului profesor este pusă la baştină, grație educației alese primită de la scumpii săi părinţi, Efim şi Zinovia. S-a născut la 6 iunie, în anul 1943, în satul Scumpia, raionul Fălești, într-o familie de oameni oneşti şi harnici. A moştenit cele mai frumoase calităţi, călăuzindu-se de chemarea biblică: „Grăbeşte-te să faci bine, fii atent şi respectuos faţă de oameni."

Consecvent principiilor, dovedind aptitudini şi abordări noi, inconfundabil ca stil şi manieră de colaborare, a contribuit în calitate de mentor la formarea ştiinţifică a numeroase generaţii de medici, cultivându-le pasiunea şi dragostea pentru cunoaştere.

În această calitate, s-a manifestat ca un veritabil lider, care adună oamenii, fiindu-i propriu un spirit înalt de echipă și ferma încredere că numai împreună, cu sprijin și atitudine colegială, pot fi făcute lucruri mari. În acest context , Domnul Profesor dă dovadă de inițiativă, vine cu idei inovatoare și propune soluții pentru rezolvarea problemelor.

Pentru buna desfăşurare a activităţilor didactice a elaborat ca unic autor sau în colaborare peste 450 de lucrări, inclusiv monografii, manuale, ghiduri, compendii, îndrumări metodice și recomandări practice. Aceste lucrări au fost elaborate atât pentru studenţi, masteranzi sau doctoranzi, cât şi pentru specialiştii din domeniu. În aceste lucrări sunt analizate critic informaţii din literatura de specialitate, fiind ulterior completate cu rezultatele cercetărilor personale din domeniu.

Profesorul Grigore Friptuleac a participat la zeci de conferințe naționale și internaționale, în cadrul cărora a prezentat rezultatele cercetărilor sale, care, împreună cu cu publicațiile ce-i aparțin, au contribuit direct la dezvoltarea științei din Republica Moldova.

În pragul trecerii în deceniul al nouălea, îi dorim viață lungă, alături de familie și de cei dragi și apropiați, putere de muncă creativă întru îmbogățirea științii moldovenești cu noi lucrări și studii, în care să dovedească același simț al obiectivității și măsurii în căutarea adevărului științific.

Mulți ani prosperi, Domnule Grigore FRIPTULEAC!

Cu profund și deosebit respect,
colegii Consiliul editorial al Revistei
științifice *One Health & Risk Management*

PROFESORUL TIBERIU HOLBAN:
O VIAŢĂ DEDICATĂ PATOLOGIILOR INFECȚIOASE

Nimic nu se face întâmplător, ci totul dintr-o cauză – și în mod necesar.

(Democrit)

A conduce o catedră e o sarcină grea, e o responsabilitate mare, un privilegiu al unor persoane înzestrate cu capacități și calități corespunzătoare. Fiecare dintre membrii catedrei a avut ocazia să constate că, Domnul Profesor Tiberiu Holban își duce destoinic povara asumată, se distinge tranșant printr-o înaltă ținută intelectuală, profesională și morală, prin care câștigă mereu sprijinul și respectul subalternilor săi. Dacă ar exista cât mai mulți oameni cu un asemenea profil moral, oameni de o atare corectitudine, onestitate și modestie, în special în spațiul public, societatea ar avea enorm de câștigat.

Absolvent al Universităţii de Stat de Medicină şi Farmacie „Nicolae Testemițanu", la vârsta de 30 de ani devine doctor în ştiinţe medicale, la 46 – doctor habilitat, iar la 51 de ani i se conferă titlul de profesor universitar.

O mare parte a eforturilor profesorului Holban sunt concentrate asupra pregătirii și creșterii viitoarelor generații de medici, competitivi pe piața muncii, precum și la sporirea prestigiului muncii intelectuale. Fiind un Profesor de elită, un cercetător asiduu în patologia infecțioasă, domnul profesor universitar Tiberiu Holban a demonstrat, prin munca și exemplul său, că e un veritabil maestru spiritual pentru generațiile de studenți și doctoranzi.

Pe parcursul carierei a fost distins cu numeroase premii, care certifică efortul depus și dedicarea incontestabilă profesiei alese.

Activitatea ştiinţifică a domnului profesor Tiberiu Holban prezintă repere diverse şi variate, ceea ce reflectă, o dată în plus, amploarea personalităţii sale. Savant cu pregătire universală, autor a peste 300 de lucrări ştiinţifice, domnul profesor a contribuit la promovarea imaginii Republicii Moldova pe plan internaţional.

Mulți ani prosperi, Domnule Tiberiu HOLBAN!

Cu profund și deosebit respect,
colegii Consiliul editorial al Revistei
ştiinţifice *One Health & Risk Management*

REQUIREMENTS FOR AUTHORS

Rules of drafting
The manuscript (written in English and French) should be in accordance with the guidelines published in: *Uniform Requirements for Manuscripts Submitted to Biomedical Journal (1994) Lancet 1996, 348, V2; 1-4* (www.icmje.org). The manuscripts should be written in font Cambria, size 11 points, spaced at 1.0, fully justified alignment, fields 2 cm on all sides. All pages must be numbered consecutively (in the right bottom corner) and continuously. Abbreviations should be explained at first occurrence in the text and should not be excessively used. The manuscripts must not exceed the number of words (without the title, affiliation, abstract and references): review articles – 4,500 words; research articles – 3,000 words; expert opinions – 2,500 words; case presentation – 1,700 words; experimental and clinical notes – 1,300 words; book reviews and presentations – 2,000 words; teaching articles – 4,000 words. The volume of tables and figures should not exceed ⅓ from the volume of the manuscript. The journal reserves the right to make any other formatting changes. Rejected manuscripts are not returned.

All manuscripts submitted for publication should be accompanied by two abstracts: in the language of origin of the article and English.

Title and authors
The title should be as short as possible (maximum – 120 signs with spaces), relevant for the manuscript content. The names of the authors should be written in full: name, surname (*e.g.:* Jon JONES). Affiliation should include: Department/Unit/Chair, University/Hospital, City, Country of each author. Beneath the affiliation, the author`s details and contact information – e-mail address (*e.g.:* corresponding author: Jon Jones, e-mail: jon.jones@gmail.com).

The structure of the manuscript
The manuscript should comprise the following subheadings (capitalized):

- **SUMMARY**
- **INTRODUCTION** (will reflect the topicality and the general presentation of the problem studied, purpose and hypothesis of the study)
- **MATERIAL AND METHODS**
- **RESULTS**
- **DISCUSSIONS**
- **CONCLUSIONS**
- **CONFLICT OF INTERESTS**
- **ACKNOWLEDGEMENT** (optional)
- **ETHICAL APPROVAL** (specify the presence or absence of a positive opinion from the ethics committee: no, date, institution ad informed consent)
- **REFERENCES**

The **summary** should contain 1,600 signs with spaces:

- **Introduction**
- **Material and methods**
- **Results**
- **Conclusions**
- **Key words:** 3-5 words

The summary should not include tables, charts, and bibliographic notes; information not included in the article.

Figures. The text included in figures should be written in font Cambria, 10 point. Each figure should be accompanied by a heading and legend. They should be numbered with Arabic numerals and placed in parentheses (*e.g.:* fig. 1). Both the title (*e.g.* Figure 1) and legend are centred, below the figure.

Tables. The text included in tables should be written in font Cambria, 10 point. Each table should be accompanied by a heading. Tables should be inserted into the text and adjusted to the width of the page. The tables are numbered in Arabic numerals and mentioned in body text in parentheses (*e.g.* tab. 1). The title of the table is centred on the top of the table (*e.g.* Table 1).

References are numbered in the order they appear in the paper. The reference sources are cited at the end of the article by using AMA style and will include only the references cited within the text (the reference is numbered within round parentheses). The in-text citations that appear more than once are numbered si-milarly as in the first citation. The number of references should not exceed 50 sources. The scientific authors are responsible for the accuracy of their writings. The reference list should include only those references that have been consulted by the authors of the manuscript. The elements of the reference sources are written exactly in accordance with the requirements.

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Reguli de tehnoredactare

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Toate manuscrisele transmise spre publicare trebuie să fie însoțite de două rezumate: în limba de origine al articolului și în limba engleză.

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Titlul ar trebui să fie cât mai scurt posibil (maximum - 120 de semne cu spații), elocvent pentru conținutul manuscrisului. Numele autorilor vor fi scrise deplin: prenume, nume de familie (*ex:* Ion RUSU). Afilierea va include: Secția/Departamentul/Catedra, Universitatea/Spitalul, Orașul, Țara pentru fiecare autor. Se vor menționa obligatoriu, mai jos, datele autorului corespondent și informațiile de contact – adresa de e-mail (*ex:* autor corespondent: Ion Rusu, e-mail: ion.rusu@gmail.com).

Structura manuscrisului

Manuscrisul va cuprinde următoarele subtitluri (scrise cu majuscule):

- **REZUMAT** (vezi cerințele mai jos)
- **INTRODUCERE** (se va reflecta actualitatea și prezentarea generală a problemei studiate, scopul și ipoteza studiului)
- **MATERIAL ȘI METODE**
- **REZULTATE**
- **DISCUȚII**
- **CONCLUZII**
- **CONFLICT DE INTERESE**
- **MULȚUMIRI ȘI FINANȚARE** (optional)
- **APROBAREA ETICĂ** (se va specifica prezența sau lipsa avizului pozitiv de la comitetul de etică: nr, data, instituția și acordul informat)
- **REFERINȚE**

Rezumatul va conține până la 1600 de semne cu spații și va cuprinde:

- **Introducere**
- **Material și metode**
- **Rezultate**
- **Concluzii**
- **Cuvinte cheie**: 3-5 cuvinte

În rezumat nu vor fi incluse tabele, grafice și note bibliografice; informații care nu sunt prezentate în studiu.

Figuri. Textul inclus în figuri trebuie să fie scris cu font Cambria, dimensiune 10 puncte. Fiecare figură trebuie să fie însoțită de titlu și legendă. Ele vor fi numerotate cu cifre arabe și vor fi menționate în text în paranteze (*ex:* fig. 1). Titlul (*ex:* Figura 1) și legenda figurii trebuie să fie scrisă centrat, sub figură.

Tabele. Textul inclus în tabele trebuie să fie scris cu font Cambria, dimensiune 10 puncte. Fiecare tabel trebuie să fie însoțită de titlu. Tabelele vor fi inserate în text, fără a depăși lățimea unei pagini. Ele vor fi numerotate cu cifre arabe și vor fi menționate în text în paranteze (*ex:* tab. 1). Titlul tabelului va fi poziționat deasupra tabelului centrat (*ex:* Tabelul 1).

Referințele trebuie să fie numerotate în ordinea apariției în text. Citarea sursei de referință va fi conform stilului *AMA*, plasată la sfârșitul articolului și va include doar referințele citate în text (menționând numărul de referință în paranteză rotundă). Dacă aceeași referință este citată de mai multe ori, ea va fi trecută în text cu același număr ca la prima citare. Numărul total de referințe nu va depăși 50 de surse. Acuratețea datelor ține de responsabilitatea autorului.

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Tous les manuscrits à publier doivent être accompagnés par deux résumés: dans la langue originale et en anglais.

Titre et auteurs
Le titre doit être le plus court que possible (maximum – 120 signes avec espaces), éloquent pour le contenu du manuscrit. Les noms des auteurs seront écrits complets: prénom, nom (*ex:* Albert LEBRUN). Quant à l'affiliation, on devra indiquer: Section/ Département/Chaire, Université/Hôpital, Ville, Pays – pour chaque auteur. Les données de l'auteur correspondant et les coordonnées – adresse e-mail (*ex:* auteur correspondant: Albert Lebrun, e-mail: albert.lebrun@gmail.com*)* seront obligatoires ci-dessous.

Structure du manuscrit
Le manuscrit comprendra les sous-titres suivants (avec lettres majuscules):

- **RÉSUMÉ** (voir les exigences ci-dessous)
- **INTRODUCTION** (reflétera l'actualité et la présentation générale du problème étudié, le but et l'hypothèse de l'étude)
- **METHODES**
- **RESULTATS**
- **DISCUSSIONS**
- **CONCLUSIONS**
- **CONFLIT D'INTERETS**
- **REMERCIEMENTS ET FINANCEMENT**
- **APPROBATION ÉTHIQUE** (préciser la présence ou l'absence d'avis favorable du comité d'éthique: no, date, institution et consentement éclairé)
- **REFERENCES**

Le **résumé** contiendra 1600 signes avec espaces:

- **Introduction**
- **Méthodes**
- **Résultats**
- **Conclusions**
- **Mots clés**: 3-5mots.

Le résumé ne comprendra pas des tableaux, graphiques et des notes bibliographiques; des informations non présentées dans l'étude.

Figures. Le texte inclus dans les figures doit être écrit avec police Cambria, taille 10 points. Chaque figure doit être accompagné par un titre et une légende. Ceux-ci seront numérotés avec des chiffres arabes et mentionnés dans le texte entre parenthèses (*ex:* fig. 1). Le titre (*ex:* Figure 1) et la légende de la figure doivent être centrés, au-dessous de la figure.

Tableaux. Le texte inclus dans les tableaux doit être écrit avec police Cambria, taille 10 points. Chaque tableau doit être accompagné par un titre. Les tableaux seront numérotés avec des chiffres arabes, mentionnés dans le texte entre parenthèses (*ex:* tab. 1), et seront insérés dans le texte, sans dépasser la largeur d'une page. Le titre du tableau sera placé au-dessus du tableau, centré (*ex:* Tableau 1).

Les **références** doivent être numérotées dans l'ordre où elles apparaissent dans le texte. La citation de la source de référence sera de style *AMA*, placée à la fin de l'article et n'inclura que des références citées dans le texte (mentionnant le numéro de référence entre parenthèses rondes). Si la même référence est citée plusieurs fois, elle sera transmise dans le texte avec le même numéro que celui de la première citation. Le nombre total de références ne dépassera pas 50 sources. La responsabilité pour l'exactitude des données est à la charge de l'auteur. Il faut indiquer dans le manuscrit seulement les références vraiment consultées par les auteurs. Les composants des sources de référence doivent être rédigés strictement selon les exigences.

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ТРЕБОВАНИЯ ДЛЯ АВТОРОВ

Правила составления

Подготовка рукописи (разработанной на английском и французском языках) будет осуществляться в соответствии с инструкциями, опубликованными в: *Uniform Requirements for Manuscripts Submitted to Biomedical Journals (1994) Lancet 1996, 348, V2; 1-4* (www.icmje.org). Авторы должны использовать шрифт Cambria, размер 11 точек, с интервалом 1,0, выравнивание по ширине, поля 2 см со всех сторон. Все страницы должны быть пронуме-рованы последовательно (в правом нижнем углу) и включать непрерывную нумерацию страниц. Сокращения должны быть объяснены при первом появлении в тексте и не должны использоваться чрезмерно. Объем рукописей не должен превышать (без названия, принадлеж-ности, резюме и литературы): для обзорных статей/рефератов – 4500 слов; для научных ста-тей – 3000 слов; для экспертных заключений – 2500 слов; для презентации случаев из клини-ческой/лабораторной практики – 1700 слов; для экспериментальных и клинических заметок – 1300 слов; для рецензий и презентаций книг – 2000 слов; для учебных статей – 4000 слов. Объем таблиц и рисунков не должен превышать ⅓ от объема рукописи. Журнал оставляет за собой право вносить любые другие изменения форматирования. Отклоненные рукописи не возвращаются.

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Название должно быть как можно короче (максимум – 120 знаков с пробелами), но дос-таточно информативным для содержания рукописи. Фамилии авторов будут написаны полностью: имя, фамилия (*например:* Иван ИВАНОВ). Принадлежность будет включать: Отделение/ Департамент/Кафедра, Университет /Больница, Город, Страна для каждого автора. Данные соответствующего автора и контактная инфор-мация – адрес электронной почты (*например:* контактная информация: Иван Иванов. e-mail: ivan.ivanov@gmail.com) будут обязательно ниже.

Структура Рукописи

Рукопись будет включать в себя следующие подзаголовки (они должны быть заглавными):

- **РЕЗЮМЕ** (см. требования ниже)
- **ВВЕДЕНИЕ** (будет отражать актуаль-ность и общее представление изучаемой проблемы, цель и гипотезу исследования)
- **МАТЕРИАЛЫ И МЕТОДЫ**
- **РЕЗУЛЬТАТЫ**
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- **ЛИТЕРАТУРА**

Резюме должно содержать 1600 знаков с пробелами и будет включать в себя следующие подзаголовки:

- **Введение**
- **Материалы и методы**
- **Результаты**
- **Выводы**
- **Ключевые слова:** 3-5 слов

Резюме не должно включать таблицы, диаграммы и библиографические заметки, инфор-мацию, не представленную в исследовании.

Рисунки (графики, диаграммы). Текст, включенный в рисунки, должен быть написан в Cambria, размер 10 пунктов. Каждый рисунок должен сопровождаться заголовком и описанием. Название (*например:* Рисунок 1) и описание рисунка должны быть вписаны по центру, в низу рисунка. Они должны быть пронумерованы арабскими цифрами и указаны в тексте в скобках (*например:* рис. 1).

Таблицы. Текст, включенный в таблицы, должен быть написан в Cambria, размер 10 пунктов. Каждая таблица должна сопровождаться заголовком. Они должны вставляться в текст, не превышая ширину страницы. Должны быть пронумерованы арабскими цифрами и указаны в тексте в скобках (*например:* таб. 1). Название таблицы должно располагаться над таблицей в центре (*например:* Таблица 1).

Литература. Источники должны быть пронумерованы в порядке их появления в тексте. Ссылки на источники должны быть в стиле *AMA*, помещены в конце статьи и включать только источники, цитируемые в тексте (упоминание номера источника в круглых скобках). Если один и тот же источник цитируется несколько раз, он будет передан в тексте с тем же номером, что и первый раз. Общее количество источников не должно превышать 50. Ответственность за точ-ность данных лежит на авторе. Будут цитиро-ваться только те источники, с которыми ознакомились авторы рукописи. Компоненты справочных источников должны быть написаны строго в соответствии с требованиями.

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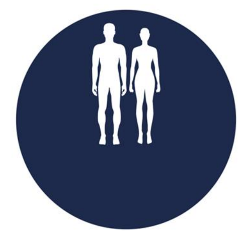
The *One Health* concept

Human health



The WHO defined health in 1946 as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity", with the later addition of "the capacity to lead a socially and economically productive life".

Animal health

The OIE defines animal welfare in 2008: an animal is in good condition if it is healthy, enjoys comfort, is well fed, is safe, is able to display its innate (natural) behavior and does not suffer from unpleasant conditions such as pain, fear and stress.

Plant and environmental health

Environmental health refers to those aspects of human health that include the quality of life determined by physical, biological, socio-economic and psycho-social factors in the environment. The interrelationships of people with the environment concern medicine, when an ecological system is in a state of equilibrium, the health of the population prevails.

Globally, the *One Health* concept is a worldwide strategy to expand interdisciplinary collaborations and communications in all aspects related to the health care of humans, domestic animals or wildlife, which can no longer be approached separately, but only jointly.

One Health addresses not only human and animal disease concerns, but also issues related to lifestyle, diet, exercise, the impact of different types of human-animal relationships, and environmental exposures that can affect both populations. In order to achieve the expected effects, it is also necessary to educate the population to make them aware of the risk factors and benefits of prevention, as well as communication and understanding between patients and healthcare providers.

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