**Current Issues in Pharmacy and Medical Sciences**
**Formerly** ANNALES UNIVERSITATIS MARIAE CURIE-SKLODOWSKA, SECTIO DDD, PHARMACIA

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# Attitudes towards vaccinations in selected medical groups in Poland

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**ARTICLE INFO**
Received 12 April 2024
Accepted 25 February 2025

***Keywords:***
vaccinations,
vaccines,
physicians,
nurses,
midwives,
students,
in-depth interviews.

**ABSTRACT**

The purpose of the study was to determine attitudes of medical staff and medical students towards vaccinations and to understand their needs and expectations regarding the popularization of vaccinations in the population. Forty semi-structured individual in-depth interviews were conducted in two groups, each with 20 interviews. The respondents were selected purposefully from all over Poland using the snowball method. The study revealed that more than a half of interviewed physicians (7 out of 13), half of all nurses (2 out of 4), and 1 out of 3 midwives observed views among healthcare workers that are inconsistent with current knowledge about the vaccinations that they are required to talk to their patients about. This suggests the need for medical staff to continually update their knowledge about vaccinations. Moreover, while medical and nursing students regarded vaccinations as effective and safe, almost all of medical students (9 out of 10) and all interviewed nursing students (10 out of 10) believed that their knowledge about vaccinations was limited. Students proposed introducing one subject devoted exclusively to vaccinations, the aim of which is to systematize knowledge in this field. In addition, vaccination education should be integrated across all study groups to enhance the societal health outcomes. What is more, healthcare professionals should be afforded opportunities to participate in training programs designed to update and expand their knowledge about vaccinations. The study suggests that there is a need to broaden the healthcare workers' competencies in effectively communicating with patients who hold unscientific views on vaccinations. Medical and nursing curricula should include a dedicated course focusing exclusively on vaccinations.

## INTRODUCTION

Reluctance and refusal of vaccinations occurring in various professional groups pose a threat to public health on a global scale [1,2]. In 2019, the World Health Organization has recognized vaccine hesitancy as one of the ten greatest threats to global health [3]. In 2020, the World Health Assembly, including Poland, endorsed the Immunization Agenda 2030: A Global Strategy to Leave No One Behind (IA2030). IA2030 presents a vision of a world where everyone, everywhere, at every age fully benefits from vaccines for good health and well-being [4]. For the European Region, the Member States have designed and crafted the European Immunization Agenda 2030 (EIA2030), for achieving the full benefits of vaccination for the next decade. One of its key regional focus areas is to prepare and engage the entire health workforce to act as advocates for immunization [5]. However, studies on the attitudes of medical professionals towards vaccinations indicate the reluctance of nurses and physicians to vaccinations, stemming from a lack of trust in health authorities, their employers and a lack of confidence in the effectiveness and safety of vaccines [6]. Healthcare professionals play an

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important role in disseminating the topic of vaccinations. Their knowledge and belief in the effectiveness of vaccinations, and even their stress and burnout influence decisions made by their patients [7]. It is also crucial to assess the medical students' knowledge of vaccinations, as well as to observe their personal opinions and beliefs in this area [8,9]. News, peer-reviewed articles, social media, family and/or friends and healthcare professionals play an important role in shaping students' views on vaccinations [9-11]. The authors of the guidelines entitled "Good practices in vaccination" accentuate the key role of primary healthcare in building trust in vaccinations, which requires the support of key institutions from the perspective of the healthcare system [12].

Qualitative research offers a deeper understanding of human experiences, context and social phenomena [13-15]. It answers the questions: "how?" and "why?", which provides the opportunity to better recognize and understand human experiences. For example, Finn, G.M. *et al*. draw attention to the significance of using qualitative research methods in assessing the education level in medical professions [16]. The goal of our study was to determine attitudes of chosen professional groups: medical staff and medical students towards vaccinations, as well as to determine their needs and expectations regarding the popularization of vaccinations in the population. The study was also intended to address the issue of medical fake news and explores strategies for managing this problem within the study group.

## MATERIAL AND METHOD

### Research method

The interviews were conducted online, through the Microsoft Teams platform, between April and September 2021. The interview covered all vaccinations, excluding COVID-19, and were recorded in audiovisual form. Each participant of the study gave their written consent to participate in the study and to record the interview. When collecting personal data from the respondents, recording was turned off. A total of 40 semi-structured individual in-depth interviews were conducted in two professional groups, 20 interviews each:

1. healthcare workers (physicians, nurses, midwives);
2. medical and nursing students.

Each interview lasted 45-60 min.

### Research tool

Interview scenarios were developed for each professional group as part of the qualitative research. Invitations to participate in the study were then distributed to individuals representing these groups using the snowball sampling method. Pilot interviews were conducted within each group, and transcripts were prepared for every interview. Detailed reports were subsequently compiled based on these transcripts.

#### *Interview scenario*

A separate, semi-structured interview scenario was prepared for each professional group, taking into account the specificity of each group. All scenarios were divided into 4 thematically similar sections. The first section covered an introductory conversation to initiate the interview. The second section concerned the respondents' workplaces and their work colleagues, and in the case of students - the higher education institution and colleagues from this environment. In the second section, the respondents were asked about their experiences connected with vaccinations at their place of work/study. The questions concerned talking about vaccinations with colleagues, patients and students. Questions were also asked about the possibility of being vaccinated against influenza at the place of work/study and about the attitude of co-workers/students to vaccinations. The third section concerned the respondents' immediate environment (family, acquaintances, neighbors, relatives and friends). In this section, respondents were asked about their experiences related to the topic of vaccinations among their closest ones. The fourth section concerned the respondent's personal attitude towards vaccinations.

### Characteristics of the study group

#### *Healthcare workers*

This study group consisted of medical professionals; including 13 physicians (specialized in 10 different fields), 4 nurses, and 3 midwives. The average age in the study group was 46 (min-max: 30-57). The shortest work experience declared by the respondents was 4 years, and the longest was 36 years. Two respondents did not have children.

### Medical and nursing students

The study group consisted of 20 students of medical universities. The average age in the study group was 23 years (min-max: 21-27). All respondents were single (unmarried) and did not have children.

Table 1 presents simplified characteristics of the study group. Detailed information about the characteristics of all study groups was presented in Table 2.

***Table 1.*** Simplified characteristics of the study group

| Group | | N | Women n (%) | Men n (%) | Average work experience (years) |
|---|---|---|---|---|---|
| Healthcare workers | Physicians | 13 | 8 (62%) | 5 (38%) | 20.6 |
| | Nurses | 4 | 4 (100%) | 0 | 18 |
| | Midwives | 3 | 3 (100%) | 0 | 28 |
| Students | Medicine | 10 | 5 (50%) | 5 (50%) | n/a |
| | Nursing | 10 | 10 (100%) | 0 | n/a |

*n/a – not applicable

***Table 2.*** Characteristics of the study group

| Study Group: Medical Students | | | | | | | |
|---|---|---|---|---|---|---|---|
| Field of study | Sex | Age (years) | Children | Place of residence | Place of study | Marital status | Year of study |
| M | F | 23 | N | Opacz Kolonia | Warsaw | unmarried | 4 |
| N | F | 22 | N | Skrzeszew | Warsaw | unmarried | 2 Bachelor's degree |
| N | F | 21 | N | Warsaw | Warsaw | unmarried | 2 Bachelor's degree |
| N | F | 22 | N | Ełk | Warsaw | unmarried | 1 Master's degree |
| N | F | 21 | N | Warsaw | Warsaw | unmarried | 3 Bachelor's degree |
| N | F | 24 | N | Warsaw | Warsaw | unmarried | 1 Master's degree |
| N | F | 21 | N | Węgrów | Warsaw | unmarried | 2 Bachelor's degree |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N | F | 21 | N | Tuchowicz | Warsaw | unmarried | 2 Bachelor's degree |
| N | F | 27 | N | Warsaw | Warsaw | unmarried | 1 Master's degree |
| N | F | 24 | N | Warsaw | Warsaw | unmarried | 2 Master's degree |
| N | F | 21 | N | Radom | Warsaw | unmarried | 2 Bachelor's degree |
| M | F | 23 | N | Warsaw | Warsaw | unmarried | 2 |
| M | F | 25 | N | Warsaw | Warsaw | unmarried | 2 |
| M | F | 21 | N | Warsaw | Warsaw | unmarried | 2 |
| M | M | 21 | N | Kielce | Kielce | bachelor | 3 |
| M | M | 23 | N | Katowice | Katowice | unmarried | 5 |
| M | M | 24 | N | Sobótka | Zielona Góra | unmarried | 4 |
| M | F | 26 | N | Olsztyn | Olsztyn | unmarried | 2 |
| M | M | 27 | N | Bydgoszcz | Bydgoszcz | unmarried | 5 |
| M | M | 22 | N | Rzeszów | Rzeszów | unmarried | 3 |

| Study Group: Medical professions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Profession | Sex | Age (years) | Children | Education | Principal place of work | Marital status | Length of service (years) |
| specialist physician neurologist | F | 32 | no | Higher | Kalisz | married | 8 |
| physician undergoing specialization in family medicine | F | 34 | yes | Higher | Bydgoszcz | married | 10 |
| physician specialist in internal diseases, infectious diseases and marine and tropical medicine | F | 41 | yes | Higher | Białystok | married | 16 |
| Physician gynecology specialist | M | 54 | yes | Higher | Siedlce | n/a | 30 |
| pediatric surgery specialist | F | 34 | no | Higher | Bydgoszcz | unmarried woman | 9 |
| nurse | F | 51 | yes | Higher | Siedlce | n/a | 14 |
| midwife | F | 56 | yes | Higher | Siedlce | n/a | 30 |
| Physician undergoing specialization in pediatrics | F | 30 | yes | Higher | Białystok | married | 4 |
| physician specialist in pediatrics | F | 54 | yes | Higher | Węgrów | n/a | 29 |
| primary care physician | M | 47 | yes | Higher | Mińsk Mazowiecki | n/a | 22 |
| physician specialist in epidemiology | M | 53 | yes | Higher | Warsaw | n/a | 29 |
| epidemiologic nurse | F | 50 | yes | Higher | Siedlce | n/a | 31 |
| midwife | F | 40 | yes | Higher | Dębe | n/a | 18 |
| occupational medicine specialist, military health care organization | M | 57 | yes | Higher | in several, Warsaw, Ożarów Mazowiecki, Błonie, Mszczonów, Grodzisk Mazowiecki among other | married | 30 |
| physician specialist in travel medicine, tropical medicine | F | 53 | yes | Higher | Warsaw | married | 27 |
| physician occupational medicine specialist | F | 53 | yes | Higher | Warsaw | married | 24 |
| nurse | F | 34 | yes | Higher | Warsaw | married | 11 |
| physician specialist in pediatrics, gastrology, pediatric gastrology | M | 55 | yes | Higher | Warsaw | married | 30 |
| nurse | K | 49 | yes | Higher | Warsaw | married | 16 |
| community midwife | K | 56 | yes | Higher | Katowice | married | 36 |

N – nursing, M – medical, F – female, M – male, N – no, n/a – not applicable

## RESULTS

Problems expressed by all groups and the identified needs regarding vaccinations are presented in the Tables 3-5.

***Table 3.*** Problems expressed in a medical group regarding talking about vaccinations with a patient

| Item no. | Problems expressed | Respondent |
|---|---|---|
| 1. | Physicians lack time to initiate a conversation about vaccinations in the outpatient clinic | P |
| 2. | Patients fail to differentiate between tick-borne encephalitis and meningitis | P |
| 3. | Feeling a lack of appropriate communication with patients expressing anti-vaccination views | P |
| 4. | Lack of sufficient materials for patients on vaccinations at the respondent's workplace | P |
| 5. | Patients do not fully understand the information provided to them by their physician during their appointment | P |
| 6. | Patients who look for information about health make use of unreliable sources | P |
| 7. | A patient's visit to a vaccination point is accompanied by stress and/or anxiety | P |
| 8. | Communication with the fiftieth or hundredth patient at a vaccination center on a given day is more difficult than with the first patient | P |
| 9. | Patients avoid the topic of vaccinations when talking to their physician | P |
| 10. | Farmers are a professional group that does not vaccinate against tick-borne encephalitis | P |
| 11. | Farmers are a professional group that is difficult to reach with information about vaccinations | P |
| 12. | The most effective vaccination message has a narrow scope | P |
| 13. | Some patients do not know about the diseases against which vaccinations protect people | P |
| 14. | During a physician's appointment, patients rarely ask about sources of information they could use | P |
| 15. | Patients obtain information about vaccinations from unreliable sources | P |
| 16. | Patients do not understand the information provided to them by medical staff | P |
| 17. | Patients are not a homogeneous group that will receive a general message | P |
| 18. | Women planning to become pregnant and also pregnant women are afraid of vaccinations | P |
| 19. | Anti-vaccination views are not always based on ignorance, but on faith, internal beliefs that are difficult to argue with | P |
| 20. | The number of materials regarding vaccinations for patients in medical facilities is insufficient | P |
| 21. | In the case of a patient receiving advice from many specialists, each of them may have the impression that the issue of vaccinations has been/will be raised by a different physician | P |
| 22. | Patients do not always find reliable information on the Internet | P |
| 23. | Patients do not have trust in physicians | P |
| 24. | Patients receive conflicting information from medical staff | P |
| 25. | Patients have greater trust in people seen in the media | P |
| 26. | After unsuccessful attempts to reach patients expressing anti-vaccination views, the physician feels irritated, helpless, and resigned | P |
| 27. | The medical facility lacks information materials on vaccinations for patients | P |
| 28. | Patients do not obtain information about vaccinations from reliable sources | P |
| 29. | Knowledge about vaccinations is specialist knowledge which the patient does not always understand | P |
| 30. | The activities of anti-vaccination organizations contribute to the strengthening of anti-vaccination attitudes among patients | P |
| 31. | Talking to a patient whose views are against vaccination arouses negative emotions in the physician | P |
| 32. | Patients do not always understand the information provided to them by their physician during their appointment | P |
| 33. | Health-related information posted on official websites is not always attractive and understandable to the patient | P |

| | | |
|---|---|---|
| 34. | Patients obtain knowledge about vaccinations from various sources including unreliable ones | P |
| 35. | Patients obtain information about vaccinations from unreliable sources | P |
| 36. | It happens that patients do not understand the information provided to them | P |
| 37. | People with anti-vaccination views participate in discussions broadcast to a wide audience | P |
| 38. | Unvaccinated populations pose greater challenges when it comes to crisis management | P |
| 39. | Bots create false information that is perceived as true by recipients | P |
| 40. | The media present a negative image of physicians, which contributes to the crisis of authorities | P |
| 41. | Patients fear any side effects after vaccination | P |
| 42. | Patients believe in conspiracy theories | P |
| 43. | The media contribute to spreading of conspiracy theories | P |
| 44. | Patients who do not believe in vaccinations cannot be convinced | P |
| 45. | Not all patients understand the information provided to them by medical staff | P |
| 46. | Patients do not fully understand how vaccinations work | P |
| 47. | Sometimes there is an aggressive attitude towards the physician among patients opposed to vaccinations | P |
| 48. | Patients obtain information about vaccinations from unreliable sources | P |
| 49. | Patients repeat myths about vaccinations | P |
| 50. | People with views opposed to vaccinations do not understand any of their physician's arguments | P |
| 51. | There are physicians who advise against vaccination against COVID-19 for patients, even though there are no contraindications | P |
| 52. | There is a lack of trust between physician and patient | P |
| 53. | Patients have doubts about vaccinations | P |
| 54. | Patients obtain information about vaccinations from unreliable sources | P |
| 55. | The physician is not always able to determine whether the patient has fully understood the information he/she received | P |
| 56. | The patient's decisions are influenced by the anti-vaccination attitudes of his/her friends | P |
| 57. | Patients' approach to conventional medicine is not always consistent | P |
| 58. | Some parents refuse to have their child vaccinated | N |
| 59. | Parents who refuse to vaccinate their child do not always sign a declaration of conscious refusal | N |
| 60. | Currently, fewer and fewer patients are taking the initiative when it comes to getting vaccinated against COVID-19 | N |
| 61. | People with a higher education degree living in urban areas are perceived by nursing staff as more difficult interlocutors when it comes to the subject of vaccinations | N |
| 62. | Patients demand a guarantee from a health care professional that their child will not experience any adverse events following vaccinations (AEFI) | N |
| 63. | Existing administrative mechanisms intended to encourage parents who oppose vaccinations to have their child vaccinated are ineffective | N |
| 64. | The patient's parents bring a document for the physician to sign certifying that the physician agrees to pay compensation if something happens to their child after vaccination | N |
| 65. | Medical staff are reluctant to talk to people who oppose vaccinations | N |
| 66. | Young people are not aware of the adverse events which are associated with the diseases against which vaccinations are directed | N |
| 67. | Patients do not fully understand the information provided to them by medical staff | N |
| 68. | Less experienced medical staff do not communicate effectively with the patient | N |
| 69. | Patients obtain information about vaccinations from social media | N |
| 70. | Scientific knowledge is difficult to learn | N |
| 71. | People look for information that goes along with their theories | N |
| 72. | People with substantive information about vaccinations are not always perceived as trustworthy | N |
| 73. | People trust individuals more than organizations | N |
| 74. | Patients usually do not understand the information given to them by medical staff | N |
| 75. | Fear and lack of knowledge influence anti-vaccination attitudes | N |
| 76. | Parents have many questions about vaccinating their children | N |
| 77. | Time to talk to parents during the appointment is limited | N |
| 78. | The media influence a parent's decision to vaccinate their child | N |
| 79. | Parents are afraid of the child's body reaction to taking of the vaccine | N |
| 80. | Materials available on websites created by people opposed to vaccinations raise doubts even among people who are convinced of vaccinations | N |
| 81. | Some female patients do not understand the information provided to them by medical staff | M |
| 82. | Some female patients only follow the recommendations of medical staff that are considered compulsory | M |
| 83. | A person with an extremely negative attitude towards the topic of vaccinations is not open to any other arguments | M |
| 84. | Patients do not always obtain information about vaccinations from reliable sources | M |
| 85. | Reliable sources of information do not always seem interesting to the patient | M |
| 86. | Not all information received from medical staff is fully understandable to the patient | M |
| 87. | The patient does not remember all information provided to him/her by the medical staff | M |
| 88. | Medical staff avoid getting into a discussion with people opposed to vaccinations | M |
| 89. | Information obtained from the Internet and the activities of anti-vaccination groups have a negative impact on parents' attitudes regarding vaccinations | M |
| 90. | Parents are not always equally opposed to vaccinating their child | M |
| 91. | Female patients who give birth for the first time usually do not understand the information given to them | M |
| 92. | The reception of information depends on the female patient's condition | M |
| 93. | Female patients sometimes do not know which vaccinations they do not consent to | M |
| 94. | Some female patients do not want to talk about vaccinations | M |
| 95. | Female patients have concerns about their child's vaccinations | M |
| 96. | Some female patients do not understand the information provided to them by medical staff | M |
| 97. | Some female patients only follow the recommendations of medical staff that are considered compulsory | M |

P – Physician, N – Nurse, M – Midwife

***Table 4.*** Identified needs of a medical group related to talking to the patients about vaccinations

| Item no. | Needs identified | Respondent |
|---|---|---|
| 1. | Physicians could benefit from training on how to communicate with patients who express unscientific views. | P |
| 2. | Patients need clear information about vaccinations and the diseases against which vaccinations are directed. | P |
| 3. | Patients could benefit from taking part in training on how to verify the credibility of the sources they use. | P |
| 4. | Patients need to have the information provided during the appointment repeated several times. | P |
| 5. | Patients sometimes need information that is not obvious from the doctor's point of view, e.g. whether they can eat and drink after vaccination. | P |
| 6. | Physicians need more time during the appointment, so that the patient can repeat the information in his/her own words. | P |
| 7. | Patients need encouragement to raise the topic of vaccinations when talking to their doctor. | P |
| 8. | Farmers, as a professional group, require separate information campaigns regarding vaccinations. | P |
| 9. | Physicians with over 16 years of experience could benefit from participating in training on communication with patients. | P |
| 10. | Medical staff should point patients to reliable sources of information. | P |
| 11. | Materials on extracting reliable information should be available in places where the patient is staying. | P |
| 12. | Medical staff should provide information to the patient in a simple way. | P |
| 13. | As part of their studies, students of medical sciences should take classes in communication with patients, which will include, among others: exercises in simplifying the message. | P |
| 14. | The message addressed to patients should be diverse. | P |
| 15. | Both medical and non-medical authorities should be involved in transmitting medical messages. | P |
| 16. | An information campaign on vaccinations should be directed to pregnant women and women planning a pregnancy. | P |
| 17. | Medical staff can benefit from training on how to talk to patients whose anti-vaccination views are based on their faith and internal beliefs. | P |
| 18. | Healthcare entities could provide more materials informing patients about vaccinations. | P |
| 19. | Every doctor should ask about your child's vaccination status during the appointment. | P |
| 20. | Patients would use materials that help them distinguish reliable information from information they come across on the Internet. | P |
| 21. | Patients' trust in physicians should be increased. | P |

| | | |
|---|---|---|
| 22. | Medical staff need training in effective communication/ persuasion. | P |
| 23. | Patients need clear, consistent information about vaccinations. | P |
| 24. | Patients should be provided with knowledge on how to verify the sources they use. | P |
| 25. | Information about vaccinations should be presented in a form that is understandable to the patient. | P |
| 26. | Anti-vaccination organizations should stop activities that threaten life and health. | P |
| 27. | Physicians should be prepared to talk to patients with anti-vaccination views. | P |
| 28. | The information provided to the patient during a medical appointment should be repeated during subsequent appointments. | P |
| 29. | Institutions publishing health-related information could include some of it in a form that is attractive to the recipient. | P |
| 30. | Patients need access to easily assimilable, proven, and reliable information on vaccinations. | P |
| 31. | People with anti-vaccination opinions should not be guests on popular television programs with the largest reach. | P |
| 32. | The public should be taught to independently verify the accuracy of information that appears on social media. | P |
| 33. | The basis of conspiracy theories in the media should be clearly contradicted. | P |
| 34. | Patients need real-life examples as arguments to convince them to get vaccinated. | P |
| 35. | Healthcare professionals should ensure that the patient understands the information provided. | P |
| 36. | Patients need education about vaccinations. | P |
| 37. | Patients need education on how to distinguish credible information from other information. | P |
| 38. | The information provided to the patient should be adapted to the patient in terms of the language used, arguments, and examples. | P |
| 39. | Up-to-date knowledge about vaccinations should be available to healthcare workers. | P |
| 40. | Patients' trust in physicians should be strengthened. | P |
| 41. | Patients should be educated about vaccinations and their doubts should be dispelled. | P |
| 42. | The patient should be equipped with the ability to distinguish reliable information from false information | P |
| 43. | Physicians should have the opportunity to further gain education in communication with the patient. | P |
| 44. | Parents require education on vaccination knowledge. | N |
| 45. | Patients must be actively encouraged to get vaccinated against COVID-19. | N |
| 46. | Medical staff could benefit from training in communication with patients, which would include providing information on vaccinations and discussing examples of staff work. | N |
| 47. | Medical staff could benefit from supplementary training courses on vaccinations. | N |
| 48. | The administrative enforcement system in the event of refusal to have a child vaccinated requires updating and improving its effectiveness. | N |
| 49. | Young people could benefit from an information campaign about the diseases against which vaccinations are directed. | N |
| 50. | On social media, people who arouse sympathy and trust among recipients should provide reliable information about vaccinations. | N |
| 51. | Information about vaccinations and the method of providing it should be adapted to the target group. | N |
| 52. | Filter bubbles are worth mentioning in organized educational campaigns. | N |
| 53. | Medical staff need training on communication with the patients where they will receive feedback. | N |
| 54. | Sources of vaccine concerns need to be identified and addressed. | N |
| 55. | Additional consultation opportunities should be created for parents who have more questions about vaccinations. | N |
| 56. | It is necessary to ensure consistent, reliable media coverage on vaccinations that is consistent with current knowledge. | N |
| 57. | Educational campaigns addressed to parents should be introduced to dispel their doubts regarding vaccinations. | N |
| 58. | The process of closing websites that spread content that threatens health and life should be made easier. | N |
| 59. | The information provided to patients by medical staff should be tailored to the patient in such way, so that it is fully understandable. | M |
| 60. | Medical staff could benefit from training on how to reach people with extremely negative views regarding vaccinations. | M |
| 61. | Patients should be encouraged to, among other things: by medical staff to use reliable sources of information. | M |
| 62. | The message regarding vaccinations should be attractive to the patient. | M |
| 63. | Patients could benefit from online courses on preparing for a doctor's appointment. | M |
| 64. | Medical staff could benefit from training on effective communication with patients, which would take into account practical aspects of discussing anti-vaccination views with patients. | M |
| 65. | A team should be established whose task will be to systematically combat disinformation regarding vaccinations | M |
| 66. | The information provided should be adapted to the female patient's condition. | M |
| 67. | If the female patient initially does not agree to vaccinate her child, you should regularly check whether the patient has not changed her mind and talk about the reasons for the decision. | M |
| 68. | The patient's concerns should be identified and addressed. | M |

P – Physician, N – Nurse, M – Midwife

***Table 5.*** Concerns of the medical group expressed regarding talking about vaccinations at work

| Item no. | Problems expressed | Respondent |
|---|---|---|
| 1. | There are views among medical staff that are contrary to science. | P |
| 2. | Medical staff cannot always distinguish facts from myths about vaccinations. | P |
| 3. | Vaccination against influenza is not a vaccination routinely promoted by employers of medical entities. | P |
| 4. | Medical staff refrain from being vaccinated not only because of fear of adverse events following immunization, but also because of reluctance to miss work. | P |
| 5. | Unvaccinated medical staff do not provide adequate information regarding vaccinations to patients. | P |
| 6. | Medical staff share anti-vaccination views with patients. | P |
| 7. | Medical staff cannot always indicate a reliable source of information. | P |
| 8. | Some healthcare workers need encouragement to get the vaccine against influenza. | P |
| 9. | Not all healthcare workers get vaccinated against influenza. | P |
| 10. | There are different views on vaccinations among medical staff. | P |
| 11. | There are different views on vaccinations among medical staff. | P |
| 12. | There are people among healthcare workers who are not fully convinced about vaccinations. | P |
| 13. | Physicians are afraid of making decisions about vaccinating patients with immunodeficiencies, oncological patients, and those suffering from rheumatic diseases. | P |
| 14. | Not all physicians have up-to-date knowledge about vaccinations. | P |
| 15. | Not all physicians have up-to-date knowledge in the field of immunology. | P |
| 16. | There are people among health care workers who did not take advantage of the opportunity to be vaccinated against COVID-19. | P |
| 17. | Some healthcare workers are against vaccination. | N |
| 18. | The employer does not provide the opportunity to be vaccinated against influenza. | N |
| 19. | There are different attitudes towards vaccinations among healthcare workers. | N |
| 20. | Healthcare workers who get vaccinated have concerns about their health after vaccination. | N |
| 21. | Nursing staff working outside vaccination centers do not broaden their knowledge about vaccinations. | N |
| 22. | According to some midwives, not all healthcare workers working with patients should be vaccinated against influenza. | M |
| 23. | There are people among medical staff who do not vaccinate their children by choice | M |

P – Physician, N – Nurse, M – Midwife

## Healthcare workers (physicians, nurses, midwives)

### *Conversation about vaccinations with patients*

According to all respondents, patients generally exhibited insufficient knowledge about vaccinations. Patients often relied on unreliable sources of information, occasionally avoided discussing vaccinations during medical consultations, lacked opportunities to learn about vaccine-preventable diseases (VPDs) and displayed a degree of distrust towards medical doctors. Among the healthcare providers, one physician (out of 13) acknowledged experiencing negative emotions when discussing vaccinations with patients holding anti-vaccination views. Additionally, one midwife (out of 3) stated that medical staff tended to avoid such confrontations. Pregnant patients expressed doubts about vaccinations. According to another respondent (a midwife), first-time mothers usually struggled to

comprehend the health information provided to them, and sometimes they were uncertain about which vaccinations they declined to consent to.

***Conversation about vaccinations at work, with co-workers***

According to the majority of physicians surveyed (8 out of 13), not all healthcare workers had up-to-date knowledge about vaccinations sufficient for effective patient communication. One out of four nurses stated that nursing staff working outside of vaccination centers did not actively update their knowledge in this area. Seven physicians, two nurses, and one midwife observed that some healthcare workers held views contrary to current scientific understanding and shared these perspectives with patients. There was also noted difficulty among medical professionals in distinguishing between factual information and myths regarding vaccinations. Furthermore, vaccination against influenza was not routinely promoted by employers within medical entities. Medical staff sometimes refrained from vaccinations due not only to concerns about adverse events, but also from reluctance to be absent from work. One midwife stated that she had encountered medical staff who chose not to vaccinate their own children.

***Conversation about vaccinations in the family***

The respondent, identified as an authority figure within their immediate environment, generally influenced the vaccination attitudes of their family members, although occasional instances arose where family members did not seek the respondent's counsel on vaccination matters. Delays in timely vaccinations of healthcare workers' children were primarily attributed to organizational challenges rather than parental choice. The knowledge level of medical staff was occasionally insufficient to adequately address concerns about vaccinations raised by their family members.

***Conversation on the respondent's attitude towards vaccinations***

Concerns about vaccinations appeared also among medical staff. One of the interviewed midwives believed that vaccinations were administered to children at too early an age. Respondents also repeatedly highlighted the issue of healthcare workers lacking time or motivation to independently update their knowledge on vaccinations. There was a sentiment that medical specialists alone are primarily responsible for staying updated on vaccination-related topics. Moreover, respondents criticized the media for inadequately emphasizing vaccinations and prevention, contributing to a prevailing state of information chaos.

**Medical and nursing students**

***Conversation on vaccinations at the higher education institutions***

According to the majority of respondents, the issue of vaccinations (except for vaccinations against COVID-19) does not come up in regular conversation. Moreover, experiences related to promoting vaccinations by higher education institutions varied among respondents. Some indicated that their university had been promoting vaccinations against influenza. However, some pointed out that the promotion of vaccinations against influenza at the university began only after the outbreak of the COVID-19 pandemic. What is more, not every respondent regularly sought vaccination against seasonal flu. This was due to lack of confidence in this vaccination. Such respondents do not feel the need for such vaccinations because: they have doubts about the need for vaccination against influenza, they consider themselves healthy people, they do not believe in the effectiveness of vaccination (such arguments were given by 4 out of 10 medical students), and because people from their immediate environment have discouraged them from being vaccinated. In addition, they believe that they knew too little about vaccinations against influenza as no-one had yet explained to them why they should be vaccinated and why vaccinations were so important. On top of that, they felt that the lack of need for influenza vaccination is justified by the lack of knowledge about the course of influenza and the issue of virus mutations. Furthermore, according to other students, the university did not encourage vaccinations against infectious diseases, including influenza. Three (out of 10) nursing students believe that the campaign to vaccinate students against influenza at the university is inefficient and not very effective.

Opinions are divided among students regarding the teaching of the topic of vaccination within their followed curriculum. Moreover, respondents also mentioned that in their followed curriculums, the subject of immunology alone addresses the concept and practice of vaccination. While six out of 20 students (nursing and medical) positively assessed the proffered information in this area, in the opinion of six out of ten medical students, not enough attention is paid to the topic of vaccinations. Indeed, one 5th-year medical student stated that so far, during his studies, topics related to vaccinations had been discussed "*casually*". He believes that he has minimal knowledge about vaccinations. He also stated that his go-to source of knowledge about vaccinations is the Google search engine. The polled students do, however, state that the topic of vaccination and anti-vaccination movements does come up in private conversation. Eight out of ten nursing students also believe that not enough attention is paid to vaccinations during their classes. The students emphasized that this topic was discussed during pediatrics classes and was limited only to learning the immunization schedule.

Overall, students of both fields believe that educating medical school students about vaccinations is insufficient. To complement it, there should be more practical classes on vaccinations with the participation of patients. Moreover, according to the majority of students of both fields, lecturers do not sufficiently provide information about vaccinations. Both medical and nursing students also repeatedly emphasized the lack of practical classes in communication with patients. In addition, students fear having any conversation with patients regarding this issue. There was also an opinion that the problem in a potential conversation with a patient about vaccinations was that patients lacked "elementary knowledge" in this area.

The outcome of this situation is that students have proposed introducing one subject devoted exclusively to vaccinations, the aim of which is to systematize knowledge in this field. Therein, the students suggested that greater emphasis should be placed on subjects such as vaccine composition, classification of vaccine preparations, their safety and efficacy, the activities of anti-vaccination movements and techniques for effective patient communication. Of note, three out of 20 students had experienced a negative opinion about vaccinations among their lecturers (including doctors).

### *Conversation on vaccinations with people from one's immediate environment (family/friends)*

Issues related to vaccinations are seldom discussed in the respondents' immediate environment (except vaccinations against COVID-19). Therein, however, Issues related to influenza and HPV vaccinations were the more frequent topic. Regarding being vaccinated against the flu, opinions among the respondents' closest relatives vary. Very often, the respondents pointed out that people from their immediate environment (family/friends) were against these vaccinations. Respondents also provided examples of their parents and grandparents voluntarily receiving the flu shot, but discouraging younger people from doing so.

According to the respondents, no one in their immediate environment questions vaccinations for children, and people from the immediate environment vaccinate their children according to the immunization schedule (Polish: PSO). They know they are obliged to and they do not question it. Most respondents did not encounter any support for anti-vaccination movements among their relatives.

### *Conversation on the respondent's attitude towards vaccinations*

All of the respondents supported the notion of being vaccinated, and considered current vaccines to be effective and safe. Moreover, the current immunization schedule raised no objections. Their attitude towards vaccinations, however, depended on their trust in medical staff, primary care physicians and pediatricians, as well as on the knowledge obtained at the university.

The students did, however, point out that fake news about vaccinations were prevailing on the Internet and in the media. In their opinion, in order to prevent the spread of this false information, education in the field of vaccination should be extended, which should cover school-age children and youth in secondary schools. Moreover, they held that vaccinations should be promoted by celebrities and politicians. All respondents believed that public confidence in vaccinations should be increased. An educational campaign aimed at children, teenagers, and adults was suggested by 17 out of 20 students. Accordingly, education for children should take place within formal classes in their schools, for youth and adults via the Internet (e.g. in social media, on YouTube), and for seniors – via the press and TV programs.

Over all, the study revealed that medical and nursing students had very limited knowledge about vaccinations, and were not familiar with the immunization schedule. Moreover, they had no knowledge about the etiology and prevention of VPDs, or of vaccine mechanisms of action, their efficiency and purposefulness. In addition, medical and nursing students did not know what combined vaccines were.

## DISCUSSION

### Most important results

Our study has uncovered numerous issues related to the approach to vaccinations among medical staff, and students in medical fields, as well as within their environment. Indeed, within the healthcare sector, some individuals oppose vaccinations, refuse to vaccinate their children, and even advise patients against certain vaccinations. These findings have also allowed us to identify specific needs arising from these issues. Communication problems with patients were repeatedly highlighted, including insufficient time to address patient doubts, difficulties patients have in understanding medical terminology, and challenging emotions arising during conversations, especially with patients who oppose vaccinations. These communications issues often lead to the avoidance of vaccination topics in subsequent appointments. Furthermore, outpatient clinics lack adequate educational materials, such as leaflets and audiovisual content, to counteract the misinformation spread by anti-vaccination organizations' websites and in conversations between patients.

Our study found that medical students generally exhibited favorable attitudes towards vaccinations, although exceptions were noted. Often, the highlighted issues included insufficient knowledge about vaccinations and the need to broaden the scope of topics covered in university curricula.

### Reference to the literature on the subject

The decision to receive vaccination is a multifaceted process influenced by numerous factors, making patient communication on this topic particularly challenging. This complexity was highlighted by participants in our study and has been extensively documented in the scientific literature. A systematic review of 38 qualitative studies [17] by Norwegian researchers, for example, examined the views and experiences of parents and guardians regarding communication about routine vaccinations for children under the age of six. Parents expected more information than they received and expected a balanced presentation of the potential benefits and risks of taking the vaccine. Healthcare workers were seen as an important information source, but concurrently, the parents expressed difficulty in determining which sources were the most reliable and provided unbiased and balanced information. Our study also confirms the critical importance of effective communication regarding vaccinations, underscoring the necessity for training healthcare workers and medical students in this area.

Pierz *et al*., in another publication on supporting American healthcare workers in effective communication on vaccinations, noted that the constant battle against misinformation among patients causes frustration among medical staff and negatively affects the physician-patient relationship. This issue was also confirmed by medical doctors who took part in our study [19]. Dempsey *et al*., in a review study describing the impact of medical staff communication on

the attitudes of patients and taking of vaccines against HPV, mentioned the so-called "best practices", which included short, firm, and unambiguous messages, and if resistance is encountered, the use of more complex techniques, such as motivational interviewing [20]. The authors of "Good practices in vaccination" suggest introducing professional doctors-influencers and other healthcare professionals into the public space who would provide health-related information in a straightforward way [12].

The need for postgraduate education of healthcare workers in the field of vaccinations, highlighted in this study, has also been demonstrated in other studies in the group of gynecologists [21-23], midwives [24], family doctors [25], nurses [26] and pharmacists [27]. Our study also confirmed the problem of insufficient knowledge about vaccinations among medical students [28-33], although it sometimes happens that students consider their knowledge about vaccinations as being adequate [34].

### Strengths and limitations of the study

The strength of the study is the relatively large group of respondents – 40 individual interviews were conducted in 2 groups. Such large groups are rare in qualitative studies on vaccination. The multidimensional approach to the topic is another advantage – the issue of vaccinations was analyzed not only in the context of the respondent's own views, but also in relation to the place of work/study (attitude of work/study colleagues towards vaccinations, availability of vaccinations against influenza in the place of work/study), as well as in relation to issues raised in conversations with patients, family and friends. The psychological aspect, however, might be a limitation – the risk of respondents giving answers that are not entirely honest and tailored to the recipient (medical university employee) due to their fear of being judged.

A further limitation of the study is not including students of other medical fields, e.g. emergency medical services, pharmacy, laboratory diagnostics, etc. Another potential issue is the choice of the study group. The respondents were selected purposefully and using the snowball method. Despite the encouragement to focus on vaccinations other than those against COVID-19, the respondents returned to the topic of the pandemic and mostly commented on vaccinations related to it. Moreover, the dynamic course of regulations regarding the COVID-19 pandemic could have changed the perception of vaccinations in the general population in a short time, and already after the end of our study.

## CONCLUSIONS

All respondent groups have identified a pervasive issue of information chaos in the media and a lack of consistent dissemination of reliable vaccination information. Continuous professional development is imperative for healthcare professionals to maintain up-to-date knowledge on immunization practices and to strengthen their capacity for critically evaluating the validity and reliability of information sources. Additionally, healthcare workers' competencies in effectively communicating with patients who hold unscientific views must be improved through appropriate training and access to relevant materials. Patients in turn should have access to concise, understandable and reliable information that justifies the need for vaccination against specific infectious diseases.

The negative portrayal of healthcare workers in the media exacerbates the crisis of authority and diminishes patient trust. Consequently, medical and nursing curricula should incorporate dedicated subjects on vaccinations and patient communication, with a strong emphasis on practical training in these areas. Moreover, medical universities should actively promote influenza vaccinations among their students.


## FUNDING

This work was supported by the National Centre for Research and Development (NCBR) [grant numbers GOSPOSTRATEG-II/0007/2020-00].


## DISCLOSURE

The authors declared no conflict of interest.


## ACKNOWLEDGEMENTS

We would like to thank Mrs. Jolanta Grygielska for her help in proofreading the article.


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