Analysis of health behaviours of pregnant women in the perinatal period during the SARS-CoV-2 virus pandemic based on the Health Behaviour Inventory

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ABSTRACT

Introduction: The regulations in the Organizational Standard of Perinatal Care in Poland emphasize the need for people caring for pregnant women to take action to promote a healthy lifestyle at every stage of pregnancy. The aim of the study was to analyse selected health behaviours of pregnant women in the perinatal period during the COVID-19 pandemic.

Material and methods: A study was conducted at the Clinical Department of Obstetrics and Perinatology at the University Hospital in Krakow. The respondents comprised 116 pregnant women in the perinatal period. The study used the diagnostic survey method. The proprietary questionnaire and the Juczyński Health Behaviour Inventory questionnaire were used. The collected data were analysed using PS IMAGO PRO 7 (IBM SPSS Statistics 27). Statistical significance was set at $\alpha = 0.05$.

Results: Despite the COVID-19 pandemic, most of the pregnant women attended regular check-ups during pregnancy, had a pap smear test, and supplemented their diet with vitamins. A lower percentage of pregnant women benefited from dental consultations. It was noted that most of the respondents planned to vaccinate their children for mandatory vaccinations; however, a different correlation was shown in the case of planning to vaccinate children for recommended vaccinations. Among the respondents who received recommended vaccinations during pregnancy, as many as 94.5% of them planned to vaccinate their children for recommended vaccinations. In the group of unvaccinated women, this percentage was significantly lower. The differences were statistically significant.

Conclusions: The results of the study proved that during the SARS-CoV-2 virus pandemic, the surveyed women represented an average level of intensification of health behaviours, which could have increased the risk of complications during pregnancy. Therefore, at every stage of pregnancy, it is worth promoting a healthy lifestyle and taking up health behaviours.

Key words: health behaviours, pregnancy, SARS-CoV-2, COVID-19.

INTRODUCTION

The first weeks of pregnancy have a significant impact on the development of the foetus and the course of the pregnancy; therefore, at this time, women should take care of their health and pay attention to their lifestyle [1]. In Poland, in the Regulation of the Minister of Health of 16 August 2018 on the Organizational Standard of Perinatal Care (Journal of Laws of 2018, item 1756) in Chapter II describing the scope of preventive services and activities in the field of health promotion, as well as diagnostic tests and medical consultations performed in women during pregnancy, the need to promote a healthy lifestyle among pregnant women at every stage of pregnancy was clearly emphasized. The key in this regard is the first visit confirming pregnancy, which should take place by the 10th week of pregnancy. If the pregnancy is physiological, the woman should come for consultations at least every 3-4 weeks, depending on the stage of pregnancy. In justified cases, medical appointments may take place more often. During the first consultation, the person providing medical care during the pregnancy should collect data on eating habits, consumption of alcohol and other drugs, determines the BMI index and orders laboratory tests [2].

In addition to basic biochemical, hormonal, serological, bacteriological, and virological tests, the pa-

tient is recommended, among other things, to have a dental check-up [2]. The World Health Organization (WHO) and scientific associations of dentists, gynaecologists, and obstetricians emphasize that oral care is an integral part of health care provided during pregnancy [3]. There is scientific evidence showing a correlation between periodontal disease and the occurrence of preterm labour and the birth of children with low birth weight [4, 5]. The implementation of therapeutic measures reduces this risk and prevents other pregnancy complications [3].

In addition, the patient is advised to perform a pap smear if it has not been performed within the last 6 months [2]. Cervical cancer is one of the most common cancers in pregnancy. The incidence ranges from 0.8 to 1.5 per 10,000 pregnancies [6]. Cervical intraepithelial neoplasia (CIN) is diagnosed in 3.4-10% of pregnant women. Scientific research has proven that performing a pap smear during pregnancy is completely safe, regardless of the gestational age, and allows the detection of possible abnormalities and immediate implementation of therapeutic measures [7].

According to the recommendations of the Polish Society of Gynaecologists and Obstetricians (PSGO), supplementation during pregnancy should include 5 active substances: iron, iodine, vitamin D, folic acid, and docosahexaenoic acid (DHA). Supplementing the normal diet with microelements, vitamins, and active substances, without specific medical indications, is not recommended in the population of healthy women. Routine iron supplementation is not recommended. The decision is made based on the results of regularly repeated blood counts and ferritin levels. The use of iron preparations is allowed in the case of iron deficiency anaemia or low ferritin levels. Iodine supplementation depends on the occurrence of thyroid diseases in pregnant women. In the case of vitamin D, the recommended procedure is individual dose selection, based on previously determined serum concentrations. Folic acid should be supplemented in all women of procreative age at a dose of 0.4 mg/day, while in pregnant women without burden the dose varies: in the first trimester between 0.4-0.8 mg/day, in the second and third trimesters and during lactation between 0.6-0.8 mg/day. In the case of DHA acids, a supplementation of at least 200 mg of DHA acids is recommended for all pregnant women. Pregnant women who consume small amounts of fish during and before pregnancy may be recommended an increased supply of DHA acids. Women at risk of preterm delivery should supplement with DHA acids at a dose of 1000 mg/day [8].

Vaccinations during pregnancy are a source of specific active artificial immunity for the mother and specific passive natural immunity for the child. Inactivated vaccines can be safely administered during pregnancy, but live vaccines must not be used [9]. According to the Protective Vaccination Program, the recommended vaccinations for pregnant women include against influenza and against diphtheria, tetanus, and whooping cough [10].

Influenza is an acute infectious disease caused by viruses of the *Orthomyxoviridae* family. The main symptoms of the disease are fever, cough, severe weakness, headache, and musculoskeletal pain [11]. A pregnant woman is more susceptible to seasonal influenza, and the risk of severe illness increases during the last trimester of pregnancy [9]. This is due to changes in the immune system, consisting of impaired cell-mediated immunity, as well as changes in lung function (decreased vital capacity and tidal volume) or haemodynamic changes in the circulatory system (increased cardiac output and increased oxygen consumption). Frequent complications of influenza during pregnancy include maternal pneumonia or acute respiratory failure. Influenza infection in the mother also carries the risk of obstetric complications, e.g. premature birth, miscarriage, stillbirth, and low birth weight. Infection can occur not only by droplet and contact, but also by vertical transmission. Infections among newborns are rare, but they are associated with an increased risk of severe and complicated course of this disease. Experts associated with the National Influenza Control Program and the Polish Society of Gynaecologists and Obstetricians recommend influenza vaccination to every pregnant woman, if there are no temporary or permanent contraindications to vaccination and it can be performed in every trimester of pregnancy and optimally in the second or third trimester [11].

Whooping cough caused by the Gram-negative aerobic bacterium *Bordetella pertussis* is a highly contagious disease characterized by severe, recurrent coughing attacks and shortness of breath in adults and older children, as well as apnoea and generalized seizures in young children. Infants, especially those under 6 months of age, are at the greatest risk of complications, while those under 3 months of age are more at risk of hospitalization and death due to pertussis infection. Scientific studies have shown that infection in a newborn is most often caused by his/her relatives – usually by the mother and to a lesser extent by the father or siblings. For preventive purposes, vaccination of pregnant women is suggested because it reduces the potential risk of maternal infection of the infant, ensures transplacental transfer of antibodies, and stimulates the production of pertussis-specific antibodies that can be passed on to the infant in breast milk. The period between the 27th and 36th week of pregnancy is recommended for vaccination [12].

Experts associated with the Polish Society of Gynaecologists and Obstetricians point to the obligation to offer COVID-19 vaccines to pregnant and lactating women. However, they recommend that each case of vaccination should be consulted with the obstetrician who provides medical care during the pregnancy. More-

over, if there are no urgent indications to vaccinate a pregnant woman, it is suggested that this action be postponed until the end of the period of organogenesis. Vaccines recommended by the Polish Society of Gynaecologists and Obstetricians are based on mRNA technology (Pfizer, Moderna), and they should be used in the first place in the group of pregnant women [13].

The aim of the study was to analyse selected health behaviours of pregnant women in the perinatal period during the COVID-19 pandemic.

MATERIAL AND METHODS

During the study, the diagnostic survey method was used. The survey technique was used with 2 research tools: the proprietary questionnaire and the Juczyński Health Behaviour Inventory questionnaire, which contains 24 statements describing various types of health-related behaviours. The survey questionnaire consisted of 38 questions about demographic characteristics, the clinical and obstetric situation, and health behaviours undertaken during the COVID-19 pandemic.

The use of the Juczyński Health Behaviour Inventory also allowed us to calculate indicators of the severity of health behaviours in 4 categories:

- correct eating habits,
- preventive behaviour,
- positive mental attitude,
- health practices.

The general indicator of the intensity of health behaviours is converted into a normalized score expressed on the sten scale. The higher it is, the greater the intensity of declared health-promoting behaviours. The results obtained in this way are interpreted as follows:

- 1-4 sten: a low score indicating a low intensity of health-promoting behaviours,
- 5-6 sten: a result showing an average intensity of health-promoting behaviours,
- 7-10 sten: a high score indicating a high intensity of health-promoting behaviours.

A study was conducted between February and March 2022 at the Clinical Department of Obstetrics and Perinatology of the University Hospital in Krakow. For this purpose, all necessary consents to conduct the study were obtained. In total, 116 women in the perinatal period, who were hospital patients at that time, joined the study. Each participant who gave informed and voluntary consent to participate in the study provided information about demographic and clinical data and answered questions about their health behaviours. The limitations of the study were the small sample size and the short duration of the study.

Finally, a group of 110 women who fulfilled all inclusion criteria in the study (age > 18 years, informed consent to participate in the study, completed questionnaires) were enrolled in the study. Based on their answers, data were obtained, which was entered into a Microsoft Office Excel 2007 spreadsheet and subjected to statistical analysis using the PS IMAGO PRO 7 program (IBM SPSS Statistics 27). Pearson's chi-square statistical test was used to analyse the correlation between qualitative variables. The level of statistical significance was $\alpha = 0.05$.

RESULTS

The study involved 116 women in the perinatal period. Finally, 110 women were qualified. The source of demographic, obstetric, and clinical information was the survey. The mean age in the study group was 31.64 years, ranging from 20 to 44 years. In total, 60% of the survey participants lived in a city, while 40% reported the countryside as their place of residence. As many as 89.1% of the respondents were married, and some described their marital status as single (6.4%), cohabitation (2.7%), or divorced (1.8%). The respondents were mainly highly educated (72.7%). In the surveyed group, 86.4% reported professional activity. The remaining respondents were studying (7.3%) or unemployed (6.4%). 60.9% of the survey participants were satisfied with their financial situation.

In the study group, 47.3% of women gave birth for the first time, while 52.7% were multiparous. The duration of pregnancy in the surveyed women ranged from the 30th week of pregnancy to the 42nd week of pregnancy. Among the respondents, 10% were women who were before the 37th week of pregnancy. As many as 24.5% of women in the study group experienced at least one miscarriage. Taking into account the clinical situation, 51.8% reported the presence of at least one comorbid condition. The most common were hypothyroidism (36.4%), gestational diabetes (15.5%), and hypertension (10.9%).

Of those participating in the study, 51.8% did not develop COVID-19. The remaining 48.2% of the respondents were infected. Taking into account the period of onset, 20.9% of women suffered from the disease before pregnancy, 2.7% in the first trimester of pregnancy, 10.9% of women suffered from the disease in the second trimester, and 13.6% in the third trimester of pregnancy.

In 99.1% cases the person who provides medical care during pregnancy was an obstetrician, while the pregnancy of one respondent was cared for by a midwife. 98.2% of women attended regular check-ups during pregnancy. Supplementation of vitamins recommended during pregnancy was declared by 96.4% of women. Dental check-ups were performed by 63.6% of pregnant women. Pap smear was performed in the recommended period by 95.4% of women (of whom 73.6% underwent examination during pregnancy, and 21.8% underwent examination less than half a year before pregnancy).

Forty per cent of the surveyed pregnant women had at least one of the recommended vaccinations during pregnancy. 58.2% of the respondents received recommendations about vaccinations during pregnancy from medical staff (57.3% from a gynaecologist-obstetrician and 0.9% from a midwife). During pregnancy the women were most often vaccinated against COVID-19 (33.6% of respondents). Pertussis vaccination was less popular (14.5% of respondents). Only 5.5% of pregnant women were vaccinated against influenza. Pregnant women who received all 3 vaccinations accounted for approximately 3.6% of the study group. The distribution of vaccinated/non-vaccinated female respondents with vaccines recommended during pregnancy is presented in Figure 1.

The mother's task is to take care of the child's health, which is manifested, among others, in subjecting it to preventive vaccinations. 94.5% of women from the study group planned to give their child mandatory preventive vaccinations. Recommended vaccinations for their children were considered by 71.8% of the respondents. Among the proposed recommended vaccinations, meningococcal, varicella, and hepatitis A were mentioned. The willingness to vaccinate their children for all proposed recommended vaccinations was declared by 35.5%. The statement of pregnant women in terms of planning their children's vaccinations is presented in Figure 2.

Based on the collected data, the correlation between not being vaccinated for recommended vaccinations during pregnancy and not vaccinating children for mandatory and recommended vaccinations was examined. Among the respondents, both vaccinated and unvaccinated (similar groups: 95.5% and 93.9%, respectively) planned to vaccinate their children for mandatory vaccination. The differences were not statistically significant ($p = 0.7317$, $p > 0.05$). There was no statistically significant correlation between being vaccinated for recommended vaccinations during pregnancy and the declaration of vaccinating children for mandatory vaccinations. On the other hand, a different correlation was demonstrated in the case of

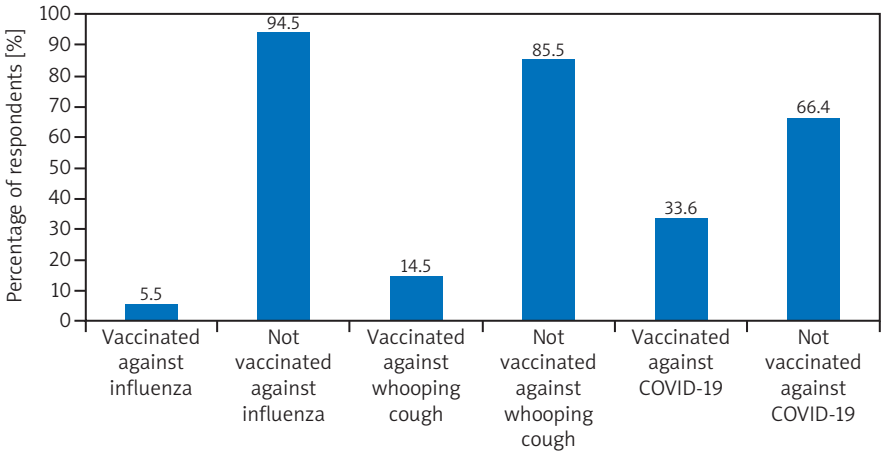

Figure 1. Distribution of percentages of respondents vaccinated/not vaccinated with vaccines recommended during pregnancy

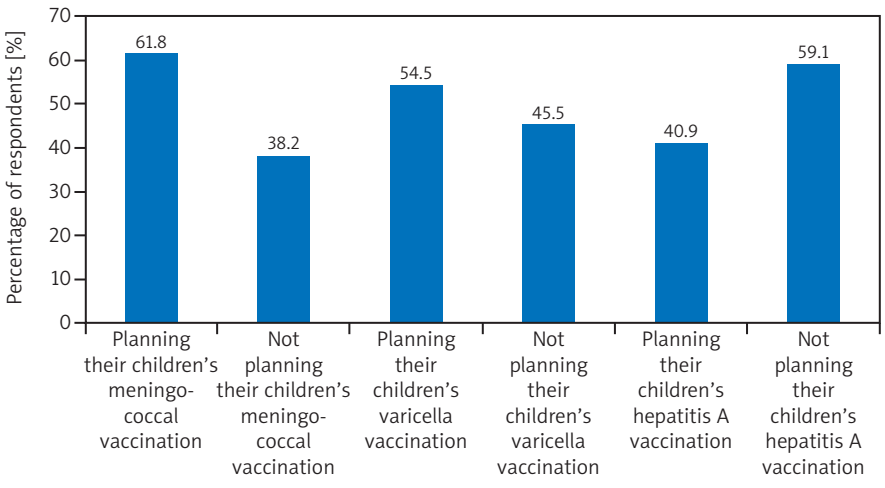

Figure 2. Statement of pregnant women in terms of planning their children's vaccinations

planning to vaccinate children for recommended vaccinations. Among the respondents vaccinated for the recommended vaccinations during pregnancy, 84.1% of the respondents planned to vaccinate their children for the recommended vaccinations. This percentage was different in the group of women not vaccinated for vaccinations recommended during pregnancy, in which it was 63.6%. The differences were statistically significant ($p = 0.0195$, $p < 0.05$). There was a statistically significant correlation between being vaccinated for the recommended vaccinations during pregnancy and vaccinating children for the recommended vaccinations.

Table 1 presents distribution of respondents' answers to the Juczyński Health Behaviour Inventory.

In the study conducted among 110 respondents, the mean was M = 86.97 points (standard deviation [SD] = ±11.00). The lowest score was 59 points and the highest was 119 points. For comparison, in the group of women for whom norms were developed, the mean for the general indicator of the intensity of health behaviours was M = 84.03 (SD = ±14.16).

Among the examined group of women, the average score (mean) on the sten scale was M = 5.90 (SD = ±1.57). The minimum score was 2, and the maximum score was 10. The exact distribution of percentages of respondents and their scores on the sten scale are presented in Figures 3 and 4.

Table 2 presents the results among respondents. For comparison, Table 3 presents the norms in the group of women for whom the Juczyński Health Behaviour Inventory was developed.

The mean of the general index of the intensity of health behaviours in the surveyed group of pregnant women was slightly higher than the mean for the general index of the intensity of health behaviours in the group of women for whom standards were developed. The Juczyński Health Behaviour Inventory is

Table 1. Answers given by respondents to the questions included in the Juczyński Health Behaviour Inventory

Statement	Respondents' answers									
	Almost never		Rare		From time to time		Often		Almost always	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
I eat a lot of vegetables and fruits.	0	0.0	1	0.9	14	12.7	54	49.1	41	37.3
I avoid colds.	0	0.0	5	4.5	14	12.7	49	44.5	42	3.2
I take seriously the tips of people expressing concern about my health.	2	1.8	13	11.8	24	21.8	51	46.4	20	18.2
I rest enough.	2	1.8	31	28.2	36	32.7	34	30.9	7	6.4
I limit the consumption of products such as animal fats and sugar.	5	4.5	28	25.5	34	30.9	32	29.1	11	10.0
I have phone numbers of the emergency services.	39	35.5	23	20.9	11	10.0	8	7.3	29	26.4
I avoid situations that depress me.	5	4.5	14	12.7	34	30.9	42	38.2	15	13.6
I avoid overworking.	11	10.0	30	27.3	43	39.1	19	17.3	7	6.4
I care about proper nutrition.	1	0.9	4	3.6	24	21.8	58	52.7	23	20.9
I follow medical recommendations resulting from my tests.	0	0.0	1	0.9	7	6.4	42	38.2	60	54.5
I try to avoid too strong emotions, stresses, and tensions.	5	4.5	18	16.4	44	40.0	32	29.1	11	10.0
I control my weight.	0	0.0	10	9.1	36	32.7	39	35.5	25	22.7
I avoid eating food with preservatives.	5	4.5	12	10.9	36	32.7	43	39.1	14	112.7
I regularly report for medical examinations.	1	0.9	6	5.5	22	20.0	46	41.8	35	31.8
I have friends and a regulated family life.	0	0.0	0	0.0	6	5.5	35	31.8	69	62.7
I sleep enough.	4	3.6	16	14.5	37	33.6	38	34.5	15	13.6
I avoid salt and highly salted food.	6	5.5	17	15.5	35	31.8	35	31.8	17	15.5
I'm trying to find out how others avoid disease.	12	10.9	24	21.8	34	30.9	31	28.2	9	8.2
I avoid feelings such as anger, anxiety, and depression.	6	5.5	15	13.6	38	34.5	39	35.5	12	10.9
I limit smoking.	8	7.3	5	4.5	2	1.8	7	6.4	88	80.0
I eat whole wheat bread.	3	2.7	5	4.5	35	31.8	36	32.7	31	28.2
I am trying to obtain medical information and understand the causes of health and illness.	3	2.7	5	4.5	21	19.1	42	38.2	39	35.5
I think positive.	3	2.7	3	2.7	21	19.1	48	43.6	35	31.8
I avoid excessive physical activity.	7	6.4	20	18.2	52	47.3	23	20.9	8	7.3

n – number of respondents, % – percentage of respondents

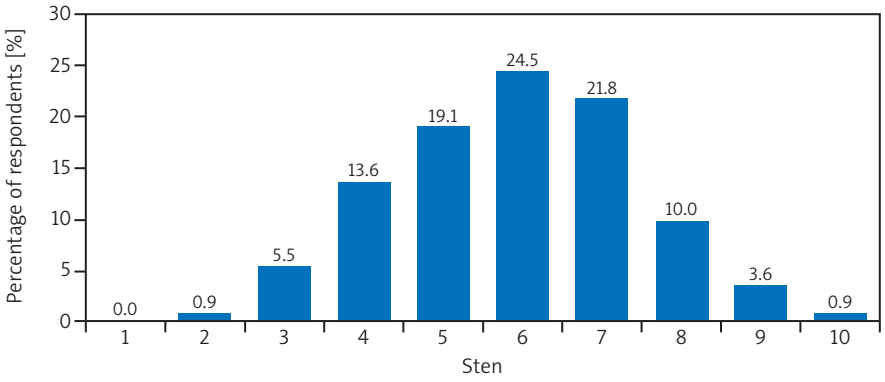

Figure 3. Distribution of percentages of respondents and their results obtained on the sten scale

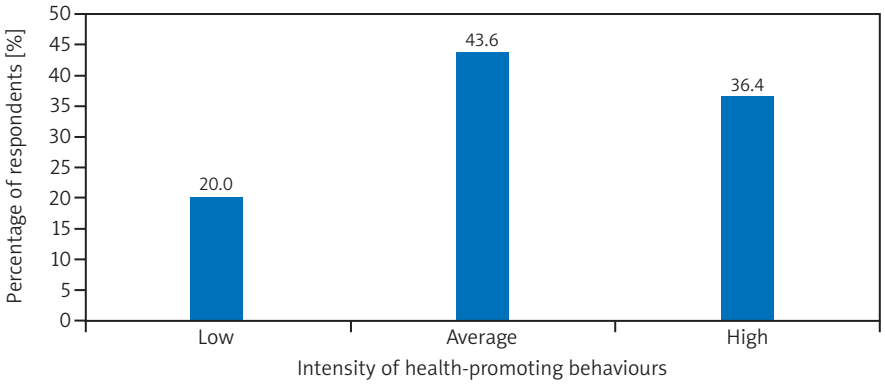

Figure 4. Results showing the intensification of health-promoting behaviors

Table 2. Values obtained by the respondents in the Juczyński Health Behaviour Inventory questionnaire in particular categories

Behaviour categories	Number of respondents (*N*)	Mean (M)	Standard deviation (SD)	Median	Minimum	Maximum
Correct eating habits	110	3.64	0.65	3.67	2.00	5.00
Preventive behaviour	110	3.72	0.59	3.67	2.17	5.00
Positive mental attitudes	110	3.71	0.61	3.83	1.83	5.00
Health practices	110	3.43	0.53	3.42	1.83	4.83

a validated tool. The general indicator of the intensity of health behaviours is converted into a normalized score expressed on the sten scale. Polish standards were developed in 1998-1999 on a group of 235 men and 261 women. The results were referred to these standards.Most of the respondents (43.6%) showed an average intensity of health-promoting behaviours. Quite a large group (36.4%) was also characterized by a high intensity of health behaviours. The surveyed pregnant women in 3 of the 4 categories of health behaviours obtained higher average scores than women for whom the norms were developed. A lower score for respondents was observed only in the category: positive mental attitudes (M = 3.71).

Table 3. Norms – average values obtained in the Juczyński Health Behaviour Inventory questionnaire for women in particular categories

Behaviour categories	Number of respondents (*N*)	Mean (M)	Standard deviation (SD)
Correct eating habits	261	3.60	0.75
Preventive behaviour	261	3.48	0.78
Positive mental attitudes	261	3.74	0.79
Health practices	261	3.53	0.78

DISCUSSION

The study analysed selected health behaviours of women in the perinatal period during the SARS-CoV-2 virus pandemic. The area of study was prophylactic and preventive activities during pregnancy: pap smear, regular visits to the dentist, vitamin supplementation, as well as the issue of vaccinations recommended during pregnancy.

Among the respondents, a satisfactory result in the prevention of cervical cancer was obtained (95.4% of the respondents). Pap smear was performed in the recommended period by 95.4% of women (of whom

73.6% underwent examination during pregnancy and 21.8% underwent examination within half a year before pregnancy). The obtained results differ, among others, from the study of Monteiro *et al.* conducted in Fortaleza in north-eastern Brazil. The results obtained by the authors indicate that only 11% of the surveyed women had a pap smear performed during pregnancy and 10.3% within 3 years before pregnancy. The remaining women did not undergo the control mainly because they had not received a recommendation from the medical staff (80.9%) [14]. Differences in the obtained results may, however, result from regional differences as well as the level of development of the health care system.

The importance of a pap smear during pregnancy is illustrated by the studies conducted by Danielska *et al.*, who retrospectively analysed 9 patients with cervical cancer diagnosed during pregnancy or the postpartum period. Three patients were diagnosed with stage I cervical cancer between the 14th and 17th week of pregnancy. Surgery was performed for treatment. Two patients were diagnosed with stage IB cervical cancer at 19 and 24 weeks of gestation. These pregnancies were continued until the 30th and 32nd week of pregnancy, after which caesarean section with radical surgery was performed. Three patients with inoperable cervical cancer diagnosed between 26 and 28 weeks of gestation underwent caesarean section at 30-32 weeks of gestation. In one patient, inoperable cervical cancer in stage IIB was diagnosed in the puerperium [15].

Dental care for a pregnant woman includes 3 important aspects: preventive measures, therapeutic procedures, and health promotion. During pregnancy, the hormonal balance changes: elevated levels of oestrogen and progesterone can cause swelling and congestion, as well as bleeding from periodontal tissues. Interdisciplinary cooperation between an obstetrician and a dentist makes it possible to limit potential complications and to undertake possible treatment in the case of inflammation [4, 16].

The study by Gaszyńska *et al.* showed that most pregnant women (78.1%) were aware of the importance of taking care of oral hygiene, teeth, and gums during pregnancy in order to care for the health of the unborn child. Despite this, only 53% of the respondents reported to the dentist [17]. In our own study, this percentage was slightly better – 63.6% of respondents completed a check-up visit at the dentist. A similar result was obtained by Kobylińska *et al.*, who noted that 62.3% of the pregnant women surveyed had a dental check-up. Due to the still high percentage of pregnant women remaining without the care of a dentist, it is important to educate patients. A huge role is played by people who provide care during pregnancy, who should direct future mothers to this type of consultation [3, 17]. Their recommendations play an important role in shaping the attitudes and behaviours of women expecting children.

Wiesner and Paśko, in their article on the use of supplements in pregnant women in accordance with the latest recommendations of the Polish Society of Gynaecologists and Obstetricians from 2020, emphasize the role, indications, and dosage of supplementation of 5 active substances (folic acid, iodine, vitamin D, DHA acid, and iron), depending on the condition pregnant woman's health. Our own research shows that over 96% of the respondents use supplements recommended during pregnancy. It should be emphasized, however, that the primary element of providing basic vitamins and macro- and microelements is a rational, balanced diet [18].

Piernikowska and Stalmirska studied the attitude of people applying for vaccinations to the necessity of vaccination in the era of a pandemic. In the study, 45% of respondents declared that vaccinations should be performed during the pandemic, while 38% of respondents believed that the epidemic situation did not affect their assessment of the implementation of preventive vaccinations. Only 17% of the respondents were negative to the need to carry out vaccinations during the SARS-CoV-2 pandemic. The authors reported that in their study group, 96% of the respondents had their children vaccinated [19]. This result is close to the one obtained in our own study, in which 94.5% of respondents planned to give their children mandatory vaccinations.

Vaccinations recommended during pregnancy against whooping cough and influenza are issues that should be popularized among pregnant women. In the conducted study, a small group (5.5%) of respondents underwent immunization against influenza virus. Slightly more respondents (14.5%) were vaccinated against whooping cough. Meanwhile, both influenza and whooping cough are still very dangerous diseases. A particularly high percentage of pertussis infections affects children up to 4 years of age [20].

Riad *et al.* in studies conducted in the period from April to October 2021 in the Czech Republic among pregnant and lactating women showed that only 2.8% of participants received vaccinations other than against COVID-19 (influenza or whooping cough), while in our own study this percentage was 7.3% [21].

Based on our own study, it can be concluded that the respondents presented health behaviours of average (43.6%) and high (36.4%) level. On the sten scale, most of the surveyed pregnant women obtained results classifying them to sten level 6. In the study by Kiersnowska *et al.*, analysing the health behaviours of primiparous women over 35 years old, about 35.5% of the respondents showed an average level and nearly 58% showed a high level of health behaviours. The author states that the average value of the general indicator of the severity of health behaviours oscillates

around sten level 7 [22], so it is a value similar to that obtained in our own study. A different view on health behaviours was presented by Pieniążek *et al.* The study mainly covered the aspect of the use of drugs by pregnant women (passive and active smoking, alcohol, coffee, psychoactive substances). The authors concluded that despite the awareness among pregnant women of the harmfulness of the above-mentioned behaviours, some of the respondents did not stop using stimulants during pregnancy (7.5% smoked cigarettes, and some women who gave up drinking alcohol did it in the second trimester of pregnancy). Nevertheless, Pieniążek *et al.* reported that the obtained high results indicate positive health behaviours of pregnant women [23]. Education conducted by doctors and midwives has a significant impact on shaping the health behaviours of pregnant women; it is of great importance in the opinion of women in the perinatal period. It is necessary to ensure that all medical professionals present a uniform attitude and refer to credible sources of knowledge.

CONCLUSIONS

During the SARS-CoV-2 virus pandemic, the surveyed women implemented selected health behaviours by regularly attending check-ups, supplementing with vitamins, and having a pap smear in the period recommended for pregnancy. Women also had dental check-ups and had vaccinations that were recommended during pregnancy, but not as commonly as regular visits or vitamin supplementation. On the basis of the Juczyński Health Behaviour Inventory completed by the respondents, the level of intensity of health behaviours in the study group can be described as average.

While caring for a pregnant woman, special attention should be paid to oral hygiene and vaccination, because their neglect may adversely affect the course of pregnancy. What is more, at every stage of pregnancy, it is worth promoting a healthy lifestyle and adopting good health behaviours.

Disclosure

The authors declare no conflict of interest.

References

1. Ignaszak-Kaus N, Ozegowska K, Piekarski P, et al. Planning and preparation for pregnancy among women with and without a history of infertility. Ginekol Pol 2018; 89: 74-79.
2. Rozporządzenie Ministra Zdrowia z dn. 16 sierpnia 2018 r. w sprawie standardu organizacyjnego opieki okołoporodowej (Dz. U. z 2018 r., poz. 1756).
3. Kobylińska A, Sochacki-Wójcicka N, Dacyna N, et al. The role of the gynaecologist in the promotion and maintenance of oral health during pregnancy. Ginekol Pol 2018; 89: 120-124.
4. Hans M, Hans VM, Kahlon N, et al. Oral health awareness and practices in pregnant females: A hospital-based observational study. J Indian Soc Periodontol 2019; 23: 264-268.
5. Kühle AM, Wacker J. Sociodemographic differences in health awareness and oral health in pregnant women. Geburtshilfe Frauenheilkd 2020; 80: 834-843.
6. Wiegoś M, Krakowski M (Eds.). Standardy postępowania w przypadkach choroby nowotworowej u kobiety w ciąży. Część II. Rak szyjki macicy, guzy jajnika. Ginekol Perinatol Prakt 2017; 2: 28-39.
7. Abdul AE, Mudau TS, Chabedi MA. Perceptions of midwives on pap smear tests during pregnancy. Asian Pac J Cancer Prev 2020; 21: 3039-3043.
8. Zimmer M, Sieroszewski P, Oszukowski P, et al. Polish Society of Gynecologists and Obstetricians Recommendations on supplementation in pregnancy. Ginekol Pol 2020; 91: 644-653.
9. Arora M, Lakshmi R. Vaccines – safety in pregnancy. Best Pract Res Clin Obstet Gynaecol 2021; 76: 23-40.
10. Komunikat Głównego Inspektora Sanitarnego z dnia 28 października 2022 r. w sprawie Programu Szczepień Ochronnych na rok 2023 (poz. 113).
11. Antczak A, Kuchar E, Nitsch-Osuch A, et al. Stanowisko ekspertów OPZG i PTGiP dotyczące szczepienia przeciw grypie kobiet w ciąży. https://opzg.pl/stanowisko-ptgip-i-opzg-dotyczace-szczepien-kobiet-w-ciazy/ (access: 11 April 2023).
12. Rosłonkiewicz-Wiechowska K. Krztusiec – stara choroba i nowe metody zapobiegania. Forum Med Rodz 2017; 11: 107-113.
13. Stanowisko PTGiP dotyczące szczepień kobiet ciężarnych przeciwko COVID-19. https://www.ptgin.pl/aktualnosc/stanowisko-ptgip-dotyczace-szczepien-kobiet-ciezarnych-przeciwko-COVID19 (access: 11 April 2023).
14. Monteiro PB, Monteiro Filho MP, de Figueirêdo JT, et al. Cytology-based screening during antenatal care as a method for preventing cervical cancer. Asian Pac J Cancer Prev 2017; 18: 2513-2518.
15. Danielska J, Moszyńska-Zielińska M, Gottwald L, et al. Pregnancy-related cervical cancer in the Material of the Regional Cancer Centre, Łódź, between 2011 and 2014. Nowotwory J Oncol 2016; 66: 359-366.
16. Pels E, Kobylińska A, Kukurba-Setkowicz M, et al. Profilaktyka stomatologiczna i postępowanie lecznicze u kobiet w ciąży. Stanowisko grupy roboczej ds. profilaktyki stomatologicznej u kobiet w ciąży Polskiego Oddziału Sojuszu dla Przyszłości Wolnej od Próchnicy. Nowa Stomatologia 2018; 4: 159-165.
17. Gaszyńska E, Klepacz-Szewczyk J, Trafalska E, et al. Dental awareness and oral health of pregnant women in Poland. Int J Occup Med Environ Health 2015; 28: 603-611.
18. Wiesner A, Paśko P. Stosowanie suplementów u kobiet ciężarnych w świetle najnowszych rekomendacji Polskiego Towarzystwa Ginekologów i Położników. Farm Pol 2021; 77: 40-47.
19. Piernikowska A, Stalmirska S. Poziom wiedzy oraz stosunek osób zgłaszających się na szczepienia do konieczności szczepień w dobie pandemii. Innowacje w Pielęgniarstwie i Naukach o Zdrowiu 2021; 6: 25-44.
20. Zasztowt-Sternicka M, Jagielska AM, Nitsch-Osuch AS. Pertussis vaccination in pregnancy – current data on safety and effectiveness. Ginekol Pol 2021; 92: 591-594.
21. Riad A, Jouzová A, Üstün B, et al. COVID-19 vaccine acceptance of pregnant and lactating women (PLW) in Czechia: An analytical cross-sectional study. Int J Environ Res Public Health 2021; 18: 13373.
22. Kiersnowska I, Bączek G, Walewska D, Węgrzyn P. Zachowania zdrowotne pierworódek po 35 roku życia. FetR 2020; 43: 165-176.
23. Pieniążek A, Gałda D, Błajda J, et al. Wybrane zachowania zdrowotne kobiet ciężarnych z Podkarpacia. Pol Prz Nauk Zdr 2017; 1: 49-57.