

SELF-RATED HEALTH STATUS AND HYGIENIC BEHAVIOUR OF PREGNANT WOMEN IN HUNGARY DURING THE PANDEMIC

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SUMMARY

Objectives: The aim of our research was to investigate the self-rated health status, health behaviour and hygiene habits of pregnant women, and to explore the influencing factors during the pandemic.

Methods: The sample included 1,200 pregnant women who gave birth in the most progressive institutions of the three examined counties in Hungary; 839 questionnaires were returned, based on which the willingness to answer can be said to be 69.9%. After data cleaning, 640 questionnaires were added to the database. Descriptive statistical analyses and correlation tests were performed, during which we used the Pearson's chi-square test and Fisher's exact test.

Results: Socio-demographic factors show a significant correlation with the perceived state of health and the degree of responsibility for health, however, the existence of a chronic disease does not affect either the self-assessed state of health or hygienic behaviour. Factors influencing hygienic behaviour include residence, education, assessed income, and gestational age. We found no correlation between health status and hygienic attitude.

Conclusions: Our results draw attention to the fact that among pregnant women – especially pregnant women with low socioeconomic status – education about hygiene habits is of particular importance. Teamwork is needed in this area, which should start during the period of preparation for pregnancy, but at the latest in the early stages of pregnancy.

Key words: self-rated health, pregnancy, hygiene

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INTRODUCTION

Life expectancy in Hungary is 74.1 years (2021), which is five years behind the EU average. The death rate due to preventable causes was the highest in Hungary among all EU countries before the pandemic, which highlights the need to reduce lifestyle and other risk factors (1). Preserving and improving the health of pregnant women is extremely important, as the lifestyle of pregnant women is related to the occurrence of premature birth and intrauterine development, and it is also known that there is a connection between foetal development and adult chronic diseases (2). The results of studies published in recent years have proven that low birth weight and premature birth are significantly influenced by the social position of the mother. Based on these, stratification variables such as the mother's lower socioeconomic status, employment, income, and education have an impact (3).

Health status and health behaviour differ significantly at different levels of social stratification. Education, age, social situation, demographic status, and health-related attitude have an influence on the health status and health behaviour of pregnant women (4).

Many external and internal factors can be blamed for the development of perinatal pathologies; among other things, social, economic and hygienic conditions, education and the state of environmental damage, dietary habits or the rate of access to health care. The rate of death around birth shows an improving trend, in 2017 there were 6.2 perinatal deaths per 1,000 births (still and live births) (3). Preterm birth and low birth weight are important health problems worldwide and are the leading cause of neonatal morbidity and mortality. The rate of premature births in Hungary has barely decreased in the last 10 years, ranging between 8.7–9%, which can be said to be high even in international comparisons, exceeding the European average (5).

Pregnancy is a physiological state that predisposes women to viral infection. The state of emergency declared in Hungary on 11 March 2020 coincided with the date when the World Health Organization (WHO) declared the epidemic a COVID-19 pandemic (6). Shortly after the outbreak of the pandemic, pregnancy was included among the conditions that pose a risk of serious illness during viral infection, including an increased risk of death. The majority of expectant mothers infected with the coronavirus survived the disease without symptoms, and the chance of infection was not higher than in the average population, yet a higher proportion of pregnant women required intensive treatment, and there was a greater chance of premature birth and caesarean section (7). In addition to the impact of COVID-19 infection on pregnant women, there are concerns about possible effects on foetal and neonatal outcomes; therefore, pregnant women are a group that requires special attention in terms of prevention, diagnosis and treatment (8).

One of the possible consequences of viral infections during pregnancy, including the COVID-19 infection, is intrauterine infection and damage to the foetus. The degree of damage can be influenced by many factors: the type of pathogen, the time of infection during pregnancy, the presence or absence of pathogen-specific maternal immunity, and the immaturity of the foetus's immune system (9). A significant proportion of foetal and neonatal mortality is attributable to intrauterine or perinatal infections, and these infections, as well as harms suffered during pregnancy, can have many long-term effects in both early and late childhood (10). To prevent the development of the COVID-19 virus and other infections and related complications, it is best to avoid contact with the virus itself by following appropriate precautions, physical distancing, using a nose-mouth mask, and personal hygiene (11). It has been proven that the transmission of viruses was lower when there was a physical distance of 1 meter or more, compared to a distance of less than 1 meter, in addition, with the protection of the face, we can also count on fewer infections (12). Furthermore, changes in lifestyle factors, including diet, exercise, smoking, alcohol consumption, screen time, and sleep, may contribute to changes in the risk distribution of COVID-19 (13). The COVID-19 pandemic has led to mandatory isolation, curfews and activity restrictions for all people around the world. The purpose of this is to promote physical distancing, thereby preventing the spread of the virus in the community, and to help the preparedness of healthcare institutions to deal with the epidemic (14).

The WHO made general recommendations for prevention, such as keeping a distance, using a nose-mouth mask, regular hand washing, and using hand sanitizer. Furthermore, it is advisable to refrain from touching the eyes, nose and mouth, without washing or hand disinfection. In addition to the above, it is recommended that if the individual suffers from a respiratory infection, he/she should take special care of his/her personal hygiene (15). Healthcare institutions had to develop their own procedures and take care of preparations for the prevention of infection. The guidelines for the care for pregnant women state that it is recommended to use, among other things, social distancing, compliance with the visiting schedule, and the use of isolation wards. Nasal masks can help reduce the spread of infection within the community (relative to non-surgical face masks, these devices have been shown to have extremely low filtering efficiency), minimize the shedding of respiratory droplets from infected individuals who may not be aware they are infected, and they do not yet show symptoms (16, 17).

Hand hygiene helps prevent the spread of infections and diseases. A domestic study revealed that the willingness to wash hands increased with the onset of the pandemic, regardless of gender, age, education, and health status, however, the use of hand sanitizers among those with higher education was significantly lower than among those who graduated from secondary or elementary school. The majority of respondents were afraid of contracting COVID-19, washed their hands more often and avoided crowds (18). Limiting visitors in hospitals is not a new approach to the treatment of infectious diseases, as relatives can contribute to outbreaks of other infectious diseases through contact. In maternity wards, partners often play a supporting role in the process of labour and delivery, but at the same time, partial restrictions or bans on visits were also observed here (19). In Hungary, in the period before the epidemic, the conditions for co-birth were ensured in the maternity wards, this was the case at the beginning of the pandemic and is still the case now. At the same time, strict epidemiological regulations are specifically observed in the wards in case of visits (20).

The overall goal of our research is to gain insight into the lifestyle and perceived health status of pregnant women living in the Northern Great Plain region of Hungary, and to learn about the background factors and habits that influence their health. The aim of this study is to examine the correlations of perceived health status, health behaviour and hygiene habits among the examined dimensions during the pandemic.

MATERIALS AND METHODS

Sample selection

When defining the sample, we took into account the distribution of the number of pregnant women and the number of live births. The number of live births in the most progressive institutions of the Northern Great Plains region of Hungary, the three counties affected by the survey, was 12,308 in total. In the County of Hajdú-Bihar, there were 5,379 live births at the University of Debrecen Clinical Centre, 1,639 at the Jász-Nagykun-Szolnok County Hetényi Géza Hospital, and 5,290 live births at the Szabolcs-Szatmár-Bereg County Hospitals and University Teaching Hospital, Jósa András Teaching Hospital (21). In our study, we tried to reach 10% of all the pregnant women registered in the previous year. Based on this, 1,200 paper-based questionnaires were distributed in the region (500 each in Szabolcs-Szatmár-Bereg County and Hajdú-Bihar County, 200 in Jász-Nagykun-Szolnok County) between January 2021 and June 2021, so mainly the pandemic during its third wave. Based on the 839 returned questionnaires, the willingness to answer was 69.9%. Of the returned questionnaires, a total of 640 could be evaluated (236 in Hajdú-Bihar County, 96 in Jász-Nagykun-Szolnok County, 308 in Szabolcs-Szatmár-Bereg County), as some questionnaires were not complete or the person responding was not a resident of the region.

Location of the Research

The location of our research was the three counties of Hungary located in the Northern Great Plain region (Szabolcs-Szatmár-Bereg County, Hajdú-Bihar County, Jász-Nagykun-Szolnok

Table 1. Characteristics of the sample (N = 640)

Characteristics		(%)	Hajdú-Bihar County n = 236 (%)	Jász-Nagykun-Szolnok County n = 96 (%)	Szabolcs-Szatmár- Bereg County n = 308 (%)
Age	< 18	3.1	2.5	2.0	3.8
	18–30	48.7	53.8	54.1	43.1
	31–40	40.6	36.4	37.5	44.8
	> 40	7.5	7.2	6.2	8.1
Location	Town	67.1	85.1	62.5	54.2
	Village	32.9	14.8	37.5	45.7
Education	Primary	7.8	7.2	11.4	7.1
	Secondary	60.3	57.2	53.1	63.9
	University	31.8	35.5	35.4	28.8
Financial status	Low	35.6	23.3	18.7	47.0
	Medium	33.4	42.0	52.2	27.0
	High	31.0	34.7	29.1	25.9
Trimester	< 12	21.5	21.2	4.2	26.4
	12–28	23.5	16.5	7.4	33.9
	> 28	55.3	62.3	88.4	39.7

County). The health status of the population of the region is one of the most unfavourable in the country, as it is among the last in the ranking of the regions in terms of almost all indicators examined (life expectancy at birth, number of deaths, summary of the analysis of the social situation of the Northern Great Plain region) (22). The poverty and low level of education of the people living in the peripheral areas of the region is high compared to the national level. In 2022 in the Northern Great Plain region, the number of foetal losses was 6,992, 47.8% per 100,000 live births*. The proportion of pregnant women requiring intensive care is 45.4% (22, 23).

Data Collection

During the investigation, we combined theoretical research with empirical questionnaire research in an interdisciplinary approach. In the self-developed questionnaire, we also used some blocks of questions from the European Population Health Survey to measure self-rated health status and perceived responsibility for health (“How is your health in general?”, “In your opinion, how much can you do for your health?”). The data collection covered the following topics: socio-demographic conditions, self-assessed health status, health behaviour, attitudes related to hygienic behaviour, and use of telemedicine methods. This publication primarily examines the perceived health status, health behaviour and hygiene habits of pregnant women.

Ethical Background of the Research

The questionnaire was filled out anonymously, the persons participating in the research cannot be identified. The research

was carried out in compliance with the applicable laws, professional guidelines and recommended ethical codes. The rules for querying and collecting the questionnaire, processing, storage, and database management complied with the relevant legislation.

The Research Ethics Committee of the Health Science Council (TUKÉB) approved the research (TUKÉB license number IV/1791-3/2021 EKV).

Statistical Methods

Proportions were calculated as descriptive statistics. For continuous variables, the Shapiro-Wilk test was used to evaluate normality. Depending on the distributions means and SDs, medians and IQRs were calculated. Pearson’s chi-squared tests and Fisher’s exact tests were used to check associations between categorical variables. Intercooled Stata v17 was used for the analyses (24).

RESULTS

During the examination of factors influencing the self-rated health status we experienced that in the case of age it can be said that the age group between 18 and 30 perceived their health status the best, while the least number of pregnant women over 40 got into this category. In connection with educational level, those gravidas’ self-rated health status with 8 or less primary school classes was the most unfavourable. Mainly participants with higher educational level were of the opinion that their health status was excellent. The type of residence also shows a correlation with health status: it can be seen clearly from the results that the perceived health status of the participants living in smaller towns

*The number of foetal losses in Hungary in 2022 was 35,920, 40.6% per 100,000 live births (of which were 14,141 foetal deaths, 16 per 100 live births).

Table 2. Background factors of self-rated health status and responsibility for health

		Self-rated health status (%)				Responsibility for health (%)			
Characteristics		Bad	Average	Good	p-value	Bad	Average	Good	p-value
Age	< 18	0.0	2.7	3.3	0.007	33.3	14.6	2.2	< 0.001
	18–30	33.3	49.1	49.1		33.3	56.1	48.3	
	31–40	33.3	33.9	42.1		33.3	21.9	42.1	
	> 40	33.3	14.3	5.4		0.0	7.3	7.4	
Education	Primary	44.4	13.4	5.8	< 0.001	33.3	34.2	5.9	< 0.001
	Secondary	44.4	61.6	60.6		33.3	53.7	60.9	
	University	11.1	25.0	33.6		33.3	12.2	33.2	
Location	Big city	11.1	11.6	21.7	< 0.001	0.0	9.8	20.4	< 0.001
	Smalltown	0.0	46.4	48.7		0.0	31.7	48.8	
	Village	88.8	42.0	29.6		100.0	58.5	20.7	
Financial status	Low	50.0	48.2	32.5	0.002	50.0	82.5	32.2	< 0.001
	Medium	12.5	34.3	33.7		50.0	17.5	34.5	
	High	37.5	15.8	33.7		0.0	0.0	33.3	
Gravidity	1	11.1	25.9	44.8	< 0.001	66.7	19.5	42.4	0.061
	2	11.1	27.7	24.6		0.0	19.5	25.3	
	3	0.0	19.6	16.6		33.3	14.6	16.9	
	> 3	78.8	26.8	14.0		0.0	46.5	15.4	
Spontaneous pregnancy	Yes	100.0	88.2	89.9	0.647	100.0	95.1	89.2	0.412
	No	0.0	11.8	10.0		0.0	4.9	10.7	
Chronic disease	Yes	44.4	18.0	13.9	0.026	33.3	20.0	14.6	0.342
	No	55.6	82.0	86.0		66.7	80.0	85.4	

*The level of significance was tested with the Fisher's exact test.
Numbers in bold indicate statistically significant values.

or villages remained below of those living in cities. Based on the perceived financial status it can be said that the perceived health status of pregnant women marking the worst or average financial status was the lowest. The more children they are expecting or the higher number of pregnancies (pregnancy with second, third child, etc.), the less they determined their health status good or very good. Those gravidas with not spontaneous pregnancy obviously determined their health status more unfavourable. In our sample, the spontaneous pregnancy did not show correlation with neither the perceived health status nor the responsibility for health ($p > 0.05$) (Table 2).

We measured the extent of responsibility for health among the gravidas. It is obvious that the age group between 18 and 40, those expecting their first child, the spontaneous pregnancy, and the participants living in a city thought that they could do much for preserving their health status. The gravidas with good or very good health status agreed the most with the fact that a mask, the visiting ban, taking vitamins or avoiding close areas help to reduce the spread of the virus. It was mostly the married pregnant women who said that they could do much or very much for their health. The poorest gravidas mostly felt that they could do little for their health. Among the participants the low educational level as well as the higher number of inhabitants living in the same household showed lower responsibility for health.

In Table 3 we show the hygienic behaviour and its influencing factors. Through the investigation of hygienic behaviour, we ex-

perienced that low self-declared income was directly proportional to rarer hand disinfection and fears of being infected by the virus, while higher income was directly proportional to better personal hygiene and more frequent hand cleansing. It were the poorest ones who feared the infected, isolation or visiting ban the least, and they also kept social distance or read about the possibilities of preventing the virus the least. We observed that personal hygiene was affected by the place of residence, educational level, financial situation, the amount of income of the pregnant women, and which trimester they were in. Getting infected did not influence personal hygiene, the use of mask and the opinion about the visiting ban. The age and chronic disease do not affect hygienic behaviour (Table 3). Spontaneous pregnancy and getting infected did not influence personal hygiene, the use of mask and the opinion about the visiting ban.

During the pandemic, 64.5% of the pregnant women changed their hygienic behaviour, most of them (86.7%) used nose-mouth masks regularly. Observing the use of masks, we can say that 72.1% of the participants said that according to them, masks could reduce the spread of the infection, but 61.2% did not agree with their use around parturition, mainly because they were afraid they could impair their breathing. The use of a mask is mainly influenced by the educational level and the fear of the virus; 21.9% of the gravidas did not agree with the use of masks because they thought they cannot protect them against the virus.

In Table 4 we figured the frequency of changing the mask and the correlations of self-rated health status with their use. Most of

Table 3. Factors affecting hygienic behaviour

Hygienic behaviour		Personal hygiene				Using the mask			Hand disinfection				Visiting ban				
Characteristics		Bad	Average	Good	p-value	Rarely	Some-times	Always	p-value	Rarely	Some-times	Always	p-value	Disagree	Partially	Agree	p-value
Age	<18	0.0	7.7	2.1	0.071	0.0	5.8	3.0	0.07	6.8	4.0	1.4	0.058	4.8	3.7	2.0	0.170
	18–30	50.0	49.6	47.9		53.3	62.3	46.8		54.3	48.0	47.3		47.9	42.0	52.4	
	31–40	41.1	37.9	41.6		33.3	26.0	42.7		31.0	41.3	43.2		37.7	46.3	39.3	
	>40	8.8	4.6	8.2		13.3	5.8	7.6		7.8	6.6	8.0		9.6	7.9	6.3	
Location	Big city	23.5	17.8	20.1	0.030	26.7	22.0	19.3	0.002	16.5	14.3	24.0	0.002	23.5	15.9	19.9	0.150
	Town	61.8	38.8	48.8		6.7	51.5	48.0		41.8	47.7	48.3		45.2	50.6	46.0	
	Village	14.6	43.4	31.0		66.6	26.5	32.7		41.7	38.0	27.6		31.3	33.5	34.0	
Education	Primary	8.8	17.2	4.7	<0.001	6.7	10.2	7.5	0.58	15.7	6.1	6.2	<0.001	3.6	9.1	9.3	0.006
	Secondary	61.8	66.4	59.0		73.3	63.2	59.6		72.6	66.1	53.2		71.2	59.1	54.8	
	University	29.4	16.4	36.4		20.0	26.5	33.0		11.8	27.7	40.5		25.1	31.7	35.9	
Financial status	Low	33.3	48.3	32.1	0.008	64.3	44.8	33.6	0.054	55.0	55.3	30.5	<0.001	50.6	40.3	25.3	<0.001
	Average	36.4	32.0	33.7		28.6	29.9	33.8		25.0	21.3	36.2		23.5	34.0	37.7	
	High	30.3	19.7	34.1		7.1	25.3	32.6		20.0	23.3	33.2		25.9	25.6	37.0	
Chronic disease	Yes	14.7	13.4	15.7	0.880	6.7	13.0	15.6	0.82	5.0	11.0	16.1	0.340	16.7	14.2	15.0	0.620
	No	85.3	86.6	84.2		93.3	87.0	84.4		95.0	89.0	83.8		83.2	85.8	85.0	
Trimester	<12	14.7	21.3	21.7	0.036	26.7	17.4	21.7	0.43	23.3	23.0	19.5	0.580	28.7	15.2	20.5	<0.001
	12–28	8.8	24.4	24.5		6.7	20.3	24.6		25.2	26.1	21.7		31.1	26.2	18.1	
	>28	76.5	54.3	53.8		66.6	62.3	53.7		51.5	51.8	58.8		40.0	58.6	61.3	

Numbers in bold indicate statistically significant values.

Table 4. Frequency of changing mask and correlations of perceived health status with mask use (N=640)

Changing mask						
Characteristics		1–3 hours (%)	2–3 times a day (%)	Daily (%)	Every few day (%)	p-value
Sample		19.8	24.1	40.1	16.6	
Family status	Single	15.8	7.2	2.0	9.7	<0.001
	Relationship	35.8	36.4	32.0	37.9	
	Married	48.3	56.3	66.0	52.4	
Education	Primary	1.7	6.0	7.6	15.5	0.007
	Secondary	66.7	60.9	58.0	58.2	
	University	31.7	33.1	34.4	26.1	
Financial status	Low	47.5	38.9	23.9	45.3	0.001
	Average	23.7	32.9	39.3	31.6	
	High	28.8	28.2	36.8	23.1	
Self-rated health status	Bad	0.0	1.3	2.0	1.9	0.010
	Average	10.8	16.5	16.1	29.1	
	Very good	89.1	82.1	81.8	68.8	
	Agree to use the mask (p=0.91)			How does the mask affect the infection? (p=0.002)		
		Yes (%)	No (%)	Not reduce (%)	Partially reduce (%)	Reduces (%)
	Bad	1.2	1.6	0.9	0.8	0.8
	Average	14.7	18.6	12.5	22.4	16.6
	Very good	83.9	79.8	86.5	76.6	82.4

Numbers in bold indicate statistically significant values.

the gravidas changed mask daily, but 16.61% used one mask for several days. Many of the participants with good or very good health status changed the mask within several hours. According to our results, health condition does not influence whether someone agrees with using a mask or not.

In addition to this, family status ($p<0.001$), financial status ($p<0.001$), someone was getting infected or not ($p=0.003$), age of the pregnant ($p<0.001$), and the level of education ($p=0.007$) correlate significantly with the use of mask. The poorer women and those who has not yet gotten infected changed their masks the least frequently. The gravidas with secondary educational level and the married ones changed their masks the most frequently. Most of those who changed their masks within several hours were women in the second trimester, while most of the women in the third trimester changed their masks only once a day.

DISCUSSION

Based on our results 80.9% of the gravidas living in the region perceived themselves to have a good or very good health status, but 15.2% have some kind of chronic disease. Compared to the Cohort'18 – Hungarian Birth Cohort Study, in 2018 84.3% of pregnant women perceived their health status as good or very good, and 36% spoke about a chronic disease during their pregnancy (25). From the results it is obvious that low socioeconomical status – similarly to the previous investigations' results – corre-

lates strongly to the responsibility for health and the self-valued health state.

Hygiene still does not get proper emphasis among pregnant women in the case of forming habits; 16.6% of the pregnant women used one mask for several days. Most of them did not agree with the mandatory use of masks in healthcare institutions, however, it had been investigated in 2020 that in those countries where the use of masks was introduced early during the Middle European COVID-19 epidemic, the number of COVID-19 deaths per 100,000 people was much lower (26).

Thus, the behaviour in connection with hygiene is affected by factors, among many others, like educational level, disadvantageous situation or low education. We should pay more attention to the support of endangered pregnant women. The WHO 2016 recommendations for pregnancy care suggest at least 8 before-birth visits for every woman, regardless of the number of pregnancies (27). In addition to this, the preconception care is essential, it is important to encourage proper hygiene even before pregnancy, and keeping it during the whole pregnancy, mainly in the situation of epidemics. Epidemic prevention is also important in the general population, but even more so among young people, since they live a communal life more often and form social relationships, where epidemiological rules are handled more laxly.

The educational activity of people taking part in pregnancy care is highly important in the field of forming and keeping pregnant women's hygienic knowledge and health prevention behaviour. The health awareness of gravidas with low socioeconomical

status has to be increased, so our goal for the future is to assess health literacy in the target group, thus we can prepare effective interventional programmes. The social-financial capital correlates strongly with health awareness, especially the parents' health awareness. The results show that in Eastern Europe healthcare knowledge of mothers and through this of pregnant women has to be broadened by several health promotion activities, especially in the group with a low socioeconomic status (28).

It is recommended to create and introduce programmes aimed at improving the motivation of healthier behaviour among pregnant women. In order to optimally choose the date of pregnancy, early education is important, which can reduce the number of teenage pregnancies. Specialists participating in pregnancy care can demonstrate the harmful effects of certain recreational drugs on the foetus, as well as the role of nutrition and mental hygiene in healthy lifestyle, within the framework of individual or even group health education and preparation for childbirth.

Limitations of the Study

In the research, the ratio of gravidas under 18 was low, only 3%, which advises caution in the conclusions coming from the results. On the part of mothers-to-be, it can also be a limitation that the answers cannot be checked, and it is difficult to give a self-assessment of the state of health. The number of those participants who said their perceived health status was bad or very bad was low. At the same time, we have to acknowledge that the low rate of pregnant women under 18 and the appropriate health status are ideal for choosing the time of having children. For an established intervention, another research among pregnant women under 18 can be recommended, by applying qualitative methods (e.g., focus group interview).

CONCLUSIONS

The pandemic drew attention to the pregnant's health maintenance, mainly to hygienic behaviour, because during pregnancy the body is much more susceptible to diseases which can endanger the infant too. Many times gravidas do not have the appropriate knowledge about hygienic behaviour, however, with the right health maintenance infections are avoidable.

Our study's results reflect that through pregnancy care, forming hygienic behaviour should get an extreme attention, where it is necessary to adjust educational activities to target groups, age, educational level, and social status to make them effective. With the introduction of appropriate preventive actions, developing professionals and the institution system, and creating effective educational programmes, we can help the developing of health awareness of pregnant women and thus contribute to a healthy life beginning.

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Conflicts of Interest

None declared

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