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ORIGINAL ARTICLE

Health literacy of women giving birth in Vilnius Perinatology Centre

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Abstract

The aim of the study To investigate the health literacy and associated factors of women giving birth at the Vilnius Perinatology Centre.

Material and methods The study was conducted between June 2022 and September 2022 at the Vilnius University Hospital in Lithuania. Five hundred and eight women who had delivered healthy newborns were surveyed. The study instrument was the European Health Literacy Questionnaire (HLS-EU-Q47) in addition to other questionnaires to assess socio-demographic factors of the mother. The Health Literacy Questionnaire was used with the permission of the authors. The survey data was processed using IBM SPSS version 23.

Results and conclusions The study showed that more than half of women who gave birth at the Vilnius Perinatology Centre had inadequate or problematic health literacy. Across all literacy indices (including health care, disease prevention, and health promotion), they particularly lack expertise in health promotion. The assessment of health information processing indices (to obtain, understand, evaluate, and apply) revealed that the evaluation of recent health information is the most challenging task for those women. The study confirmed the assumption that women with higher levels of education and who had attended maternity skills training have higher levels of health literacy. Higher rates of unplanned births are also linked to lower levels of health literacy among women.

Keywords Pregnancy · Health literacy · Health information · Health care · Disease prevention · Health promotion

Introduction

Health literacy is defined as the knowledge and skills that enable an individual to acquire and understand health information, and make appropriate decisions that will affect his health (Baccolini et al. 2021). The World Health Organisation (WHO) has identified health literacy as one of the key factors in health promotion, and included it in the 2030 Agenda for Sustainable Development (Duplaga 2020).

Sørensen et al. (2012) identifies three main domains of health literacy — health care, disease prevention, and health promotion — as well as four stages of processing relevant health information, also known as competences — to obtain, understand, evaluate, and apply that information (Eyüboğlu and Schulz 2016). In other words, health literacy is the capacity to obtain, comprehend, and critically assess data about health care and illness prevention from a range of sources, and the ability to efficiently use this knowledge: the capacity to take care of oneself and work with health care specialists to maintain and improve one's health. Lee et al. identify four essential facets of health literacy behaviour: 1) taking care of your own health, 2) the avoidance of harmful behaviour, 3) preventive behaviour and health facility attendance, and 4) appropriate use of medications (Habte et al. 2022).

Low health literacy is linked to poorer health care, less favorable subjective health (physical and mental)

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(Garcia-Codina et al. 2019, Institute of Medicine (US) Committee on Health Literacy 2004), inappropriate use of medications, a lack of cooperation and bad communication with medical professionals, and failure to follow doctors' orders. There is also a correlation between low health literacy and more frequent hospitalisations (Institute of Medicine (US) Committee on Health Literacy 2004).

Women with low health literacy are more likely to use drugs during pregnancy, and are less likely to visit antenatal care professionals; thus, they may be less prepared for childbirth (Javtokas and Žagminas 2013).

Parents' level of health literacy impacts not only their own health but also the care and health of their babies (Jociutė and Valentienė 2020, Baccolini et al. 2021). Parents with lower health literacy are more likely to experience unexpected and unanticipated health issues in children (such as infectious diseases, injuries, and drug poisoning), which leads to more visits to emergency departments (Jordan and Hoebel 2015). Children of parents with low health literacy have a shorter breastfeeding period (Julie et al. 2011) and are more likely to be obese (Jordan and Hoebel 2015).

Influences of culture, society, and families are crucial in shaping attitudes and beliefs. Health literacy is influenced by both cultural and individual factors (Kohan et al. 2007). In order to better understand how health literacy can be improved, it is important to assess the factors that may influence the level of health literacy of individuals (mothers in this study): education, maternity training course attendance, child-rearing experience, family support, and other.

Interest in health literacy has grown considerably during the last decade (Lee et al. 2004). Studies show that a lower focus on the health literacy of the population leads to its poorer health and, consequently, to higher costs for the health system (Palumbo 2017). Health literacy studies aid in determining which population groups require the most attention in order to avoid problems in the future. There are many studies on the health literacy of the general population, but very few with a focus on specific groups. Investigating the mothers of newborns is essential because their health literacy can lead to long-term health consequences for their children. Despite the necessity of assessing this group's health literacy, very little research on it has been conducted in European countries. In Lithuania, the health literacy of women with newborns has not been investigated.

The aim of the study is to investigate the health literacy and associated factors of women giving birth at the Vilnius Perinatology Centre.

Material and methods

Five hundred randomly selected mothers of newborns participated in this study. The mean age of the subjects was 31.8 ± 4.9 years (range 18 to 43 years); 66.3% of them had higher education, 24.0% had attended maternity courses, 80.0% of the study participants were married, and 59.0% already had children (from 1 to 5 children).

All study policies and procedures were approved by the Vilnius Regional Committee for Biomedical Research Ethics. Eligible participants had to meet the following criteria: 1) had given birth 2–3 days before, 2) were not younger than 18 years old, 3) didn't have a serious physical or mental health condition, 4) voluntarily agreed to sign a written informed consent, and 5) had a healthy newborn, born at 37–41 weeks of pregnancy.

The study was conducted at the Lithuanian Perinatology Centre, which is a part of the Vilnius University Hospital 'Santaros klinikos', the largest healthcare institutions in Lithuania, providing the highest quality outpatient and inpatient services. Since women from all counties of Lithuania come to give birth at this centre, it hosts the largest number of births in all country: approximately 3300 per year. So, choosing this centre allowed us to obtain study results that represent the health literacy of all women who give birth in Lithuania.

Potential study participants were randomly chosen and directly contacted at the hospital where they were staying after giving birth. They were informed about the purpose of the study, as well as about the use of the collected data, and were offered to participate. After signing the informed consent, subjects were given a questionnaire to fill out. The questionnaires were filled out independently, anonymously, and without the participation of the researcher, thus reducing the likelihood that subjects would be inclined to give more socially desirable responses.

One section of the questionnaire focused on the mother's socio-demographic factors (age, number of given births, education, marital status, experience of attending maternity courses, pregnancy planning, etc.), while the other assessed her health literacy. The health literacy of newborns' mothers was assessed using the European Health Literacy Questionnaire (HLS-EU-Q47) (Institute of Medicine (US) Committee on Health Literacy 2004), Lithuanian version. The HLS-EU-Q47 consisted of 47 items addressing self-reported difficulties in obtaining, understanding, evaluating, and applying information related to health care, disease prevention, and health promotion. Study participants were asked to rate each of these items on a 4-point Likert scale (1-very difficult, 2-difficult, 3-easy, 4-very easy). Based on the data collected, a general health literacy index, indices of three health domains, and four indices of processing relevant health information were calculated.

The indices of health literacy were obtained using this formula:

Index = (mean − 1) ∗ (50/30).

The mean here is the average of scale items for each individual; 1 is the minimum possible value of the mean, 3 is the range of the mean, and 50 is the selected maximum value of the new metric.

The HLS-EU-Q47 showed high reliability: all scales' Cronbach's α coefficients were 0.780–0.965.

Based on the calculated indices, each subject was classified into one of four categories: inadequate health literacy (scores 0–25), problematic health literacy (scores 26–33), sufficient health literacy (scores 34–42), or excellent health literacy (scores 43–50).

Study data was processed and analysed using the Statistical Package for Social Sciences (SPSS 23.0). Normality of the data was checked using the Shapiro–Wilk test, accompanied by skewness and kurtosis parameters. The distribution of the health literacy scale and its subscales data was close to normal; hence, parametric criteria were used to compare the means: for the comparison of two different study groups, Student's *t*-test for independent samples, and for more than two study groups, one-way ANOVA; repeated measures ANOVA was used to compare the estimates of health literacy aspects of the same subjects. Pearson or Spearman correlation analysis was used to assess the linear relationships between mothers' health literacy and other quantitative variables such as age, education level (Pearson — when the data are of the interval type, the distribution is close to normal; Spearman — in the case when the data are rank-based or the distribution is not normal). The results are interpreted as statistically significant if the *p*-value is lower than the significance level α = 0.05.

Results

Maternal health literacy

According to the general health literacy index, more than half of the mothers had a problematic health literacy. Only one-third of study participants had sufficient or excellent health literacy (Fig. 1).

Individual domains of health literacy were found to be problematic or inadequate in more than half of the respondents in the areas of health care, disease prevention, and health promotion (Fig. 2).

Tables 1 and 2 present and compare estimates of maternal health literacy. With regard to general health literacy competences, the health care index is the highest (mean 32.76 ± 5.86) and the health promotion index is the lowest (mean 29.20 ± 7.16). The means of all these health literacy indices are statistically significantly different (F = 91.257, $p < 0.001$), health care indices are significantly higher than disease prevention and health promotion indices, and disease prevention indices are significantly higher than health promotion indices ($p < 0.001$).

According to the mothers' health information processing scores, their ability to understand health information was the greatest (index mean 33.30 ± 6.57), while the ability to

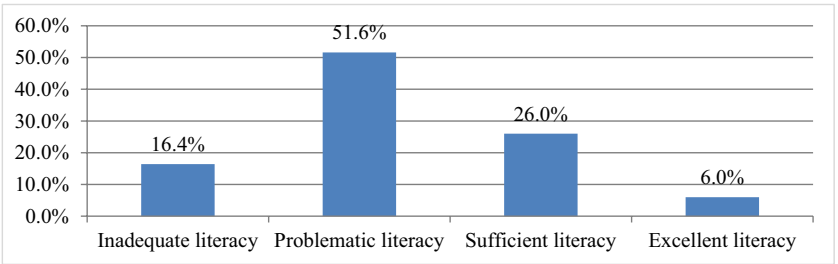

Fig. 1 Histogram of the general maternal health literacy index

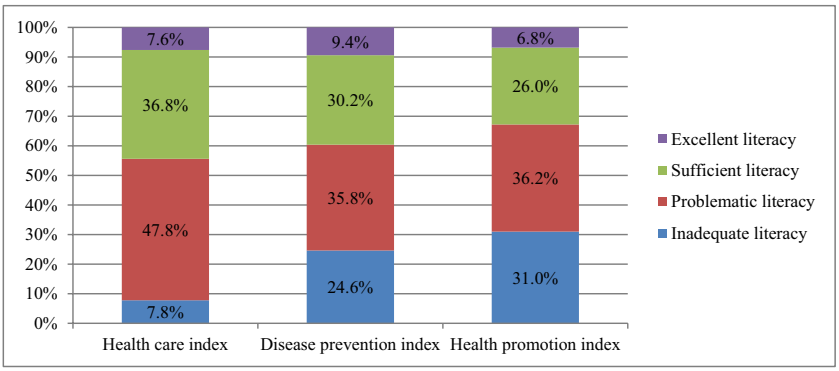

Fig. 2 Histograms of indices of health care, disease prevention, and health promotion

Table 1 Estimates and comparisons of study participants' health literacy indices (one-way ANOVA test results)

Variables (indices)	*N*	Mean ± SD	F	*DF*	*P*
Health care	500	32.76 ± 5.86	91.257	1.861	< 0.001
Disease prevention	500	30.71 ± 7.91			
Health promotion	500	29.20 ± 7.16			
General health literacy index	500	30.93 ± 6.09			
Ability to obtain health information	500	29.85 ± 8.37	88.696	2.716	< 0.001
Ability to understand health information	500	33.30 ± 6.57			
Ability to evaluate health information	500	29.61 ± 6.91			
Ability to apply health information	500	31.25 ± 5.73			

Table 2 Estimates and comparisons of study participants' health literacy indices (post-hoc LSD test results)

Variables (indices) (I)	Variables (indices) (J)	Mean difference (I–J)	*P*	F	*DF*	η^2
Health care	Disease prevention	2.06	< 0.001*	91.257	1.861	0.155
	Health promotion	3.57	< 0.001*			
Disease prevention	Health promotion	1.51	< 0.001*			
Ability to obtain health information	Ability to understand health information	−3.447	< 0.001*	88.696	2.716	0.151
	Ability to evaluate health information	0.245	0.355			
	Ability to apply health information	−1.402	< 0.001*			
Ability to understand health information	Ability to evaluate health information	3.692	< 0.001*			
	Ability to apply health information	2.045	< 0.001*			
Ability to evaluate health information	Ability to apply health information	−1.646	< 0.001*			

*indicates significance

obtain health information (index mean 29.85 ± 8.37) and to evaluate health information (index mean 29.61 ± 6.91) were the lowest. The indices of the ability to obtain health information and the ability to evaluate health information did not statistically significantly differ ($p > 0.05$); the index of ability to understand health information was statistically significantly higher than all other indices: of ability to obtain, evaluate, and apply health information ($p < 0.001$); the index of ability to apply health information was significantly higher than the indices of ability to obtain and evaluate health information.

Relationships between socio-demographic factors of mothers and their level of health literacy

Further analysis was done to investigate the associations between mothers' socio-demographic characteristics (age, education level, marital status, pregnancy planning, number of pregnancies) and their health literacy indices.

The correlation analysis did not show any statistically significant relationships between mother's age and their health literacy competency indices or health information processing indices ($p > 0.05$), but revealed a weak, statistically significant association between the mother's education level and the indices mentioned above: the more educated a woman is, the higher is her general health literacy index ($r = 0.298$, $p < 0.001$), health care, disease prevention, health promotion indices ($r = 0.198$, $p < 0.001$; $r = 0.345$, $p < 0.001$; $r = 0.206$, $p < 0.001$) as well as the indices of ability to obtain, understand, evaluate and apply health information ($r = 0.278$, $p < 0.001$; $r = 0.332$, $p < 0.001$; $r = 0.184$, $p < 0.001$; $r = 0.195$, $p < 0.001$) (Table 3).

According to the results of the Student's *t*-test (Table 4), the indices of health care, disease prevention, health promotion, and overall health literacy index of primiparous women were not statistically significantly different from multiparous women ($p > 0.05$). However, a comparison of their health information processing indices showed that women who give birth not for the first time have significantly greater ability to evaluate actual health information than those who give birth for the first time (index means accordingly 30.22 ± 6.82 and 28.72 ± 6.97) ($p < 0.05$).

One-way ANOVA comparison of subjects with one, two, three, and more children revealed statistically significant differences in their overall health literacy competence ($p < 0.001$), in individual health literacy domains ($p < 0.01$), and in the four aspects of health information processing

Table 3 Correlations between mother's age, education level and their health literacy indices

Variables (indices)	Age		Education level	
	R	*P*	*R*	*P*
Health care	0.007	0.872	0.198*	< 0.001*
Disease prevention	−0.020	0.663	0.345*	< 0.001*
Health promotion	−0.052	0.250	0.206*	< 0.001*
General health literacy index	−0.024	0.597	0.298*	< 0.001*
Ability to obtain health information	−0.043	0.343	0.278*	< 0.001*
Ability to understand health information	−0.002	0.956	0.332*	< 0.001*
Ability to evaluate health information	−0.015	0.737	0.184*	< 0.001*
Ability to apply health information	−0.020	0.661	0.195*	< 0.001*

*indicates significance

Table 4 Comparison of health literacy indices of primiparous and multiparous women

Variables (indices)	Primiparous women ($n = 205$), mean ± SD	Multiparous women ($n = 295$), mean ± SD	*T*	*DF*	*P*
Health care	32.69 ± 6.00	32.81 ± 5.76	−0.231	498	0.818
Disease prevention	30.30 ± 7.87	30.99 ± 7.94	−0.968	498	0.334
Health promotion	29.45 ± 7.26	29.02 ± 7.09	0.655	498	0.513
General Health Literacy Index	30.86 ± 6.15	30.98 ± 6.05	−0.226	498	0.821
Ability to obtain health information	30.13 ± 7.94	29.66 ± 8.67	0.625	462.023	0.532
Ability to understand health information	33.45 ± 6.53	33.20 ± 6.60	0.418	498	0.676
Ability to evaluate health information	28.72 ± 6.97	30.22 ± 6.82	−2.400	498	0.017*
Ability to apply health information	31.40 ± 5.69	31.15 ± 5.77	0.465	498	0.642

*indicates significance

($p < 0.01$) (Table 5). In order to carry out a more detailed analysis and to determine which of these groups perform differently from the others, the results of the pairwise comparison of the post-hoc LSD test were assessed (Table 6). It showed that for women with one, two, and three children, the majority of health literacy indices were similar ($p > 0.05$), only their health care index and their capacity to evaluate health information indices differed statistically significantly ($p < 0.05$): women with three children had statistically significantly higher health care and health information evaluation indices than women with one or two children ($p < 0.05$); women with two children had statistically significantly higher health information evaluation indices than women with one child ($p < 0.05$). Women with 4–6 children were the most prominent of all the women surveyed: all of their health literacy indices were statistically significantly lower than those of women with one, two, or three children ($p < 0.05$). The difference in educational attainment between women with 4–6 children and women with fewer children was computed to further understand the probable causes of these discrepancies. The first group of women had a statistically significantly lower level of education ($p < 0.001$) and none of them had received maternity skills training.

There was no statistically significant difference in the mean of health literacy and health information processing indices between married women and unmarried women living with a partner ($p > 0.05$).

Subjects who had received maternity skills training (compared to those who had never received such training) had statistically significantly higher indices of health care, disease prevention, health promotion indices, and the overall health literacy index ($p < 0.05$; $p < 0.001$; $p < 0.001$; $p < 0.001$); their indices demonstrating the ability to obtain, understand, and evaluate pertinent health information were statistically significantly higher as well ($p < 0.001$; $p < 0.001$; $p < 0.05$) (Table 7). A comparison of these two groups' educational attainment revealed that the overall educational attainment of women who had not undergone maternity skills training was statistically significantly lower ($p < 0.001$).

Subjects who had planned their last pregnancy (compared to those who did not) had statistically significantly higher scores on the health care, disease prevention, health promotion indices, and the overall health literacy index ($p < 0.001$; $p < 0.01$; $p < 0.01$; $p < 0.001$); they also had statistically significantly higher indices demonstrating their ability to obtain, understand and apply relevant health information ($p < 0.001$; $p < 0.001$; $p < 0.001$) (Table 8).

Table 5 Comparison of health literacy indices for subjects with one, two, three, or more children (one-way ANOVA test results)

Variables (indices)	Number of children	*N*	Mean ± SD	F	*DF*	*P*
Health care	1	205	32.69 ± 6.00	6.609	3	< 0.001*
	2	188	32.58 ± 5.07			
	3	79	34.66 ± 7.06			
	4–6	28	29.15 ± 3.84			
Disease prevention	1	205	30.30 ± 7.87	5.752	3	0.001*
	2	188	31.44 ± 8.11			
	3	79	31.92 ± 7.55			
	4–6	28	25.37 ± 5.40			
Health promotion	1	205	29.45 ± 7.26	6.203	3	< 0.001*
	2	188	29.42 ± 6.91			
	3	79	29.96 ± 7.57			
	4–6	28	23.67 ± 4.29			
General Health Literacy Index	1	205	30.86 ± 6.15	7.619	3	< 0.001*
	2	188	31.18 ± 5.72			
	3	79	32.27 ± 6.60			
	4–6	28	26.08 ± 4.06			
Ability to obtain health information	1	205	30.13 ± 7.94	5.097		0.002*
	2	188	30.15 ± 8.24			
	3	79	30.51 ± 9.20			
	4–6	28	23.94 ± 8.09			
Ability to understand health information	1	205	33.45 ± 6.53	7.584	3	< 0.001*
	2	188	33.30 ± 6.27			
	3	79	34.77 ± 7.17			
	4–6	28	28.06 ± 4.39			
Ability to evaluate health information	1	205	28.72 ± 6.97	8.983	3	< 0.001*
	2	188	30.06 ± 6.70			
	3	79	32.27 ± 6.72			
	4–6	28	25.52 ± 5.38			
Ability to apply health information	1	205	31.40 ± 5.69	5.457	3	0.001*
	2	188	31.46 ± 5.68			
	3	79	31.85 ± 6.29			
	4–6	28	27.10 ± 2.49			

*indicates significance

Table 6 Pairwise comparison of health literacy indices for subjects with one, two, three, or more children (post-hoc LSD test results)

Comparison of subject groups by number of children	Mean differences in health literacy indices							
	HC	DP	HP	GHL	AO	AU	AE	AA
1 ch. vs 2 ch.	0.11	−1.14	0.02	−0.32	−0.02	0.15	−1.34*	−0.07
1 ch. vs 3 ch.	−1.97*	−1.62	−0.51	−1.41	−0.38	−1.33	−3.55**	−0.46
1 ch. vs 4–6 ch.	3.54**	4.93**	5.78**	4.78**	6.19**	5.38**	3.20*	4.30**
2 ch. vs 3 ch.	−2.08**	−0.48	−0.53	−1.09	−0.36	−1.48	−2.21*	−0.39
2 ch. vs 4-6 ch.	3.44**	6.07**	5.76**	5.10**	6.21**	5.23**	4.55**	4.36**
3 ch. vs 4-6 ch.	5.51**	6.55**	6.29**	6.19**	6.57**	6.71**	6.75**	4.75**

*The difference is statistically significant, $p < 0.05$.

*The difference is statistically significant, $p < 0.01$.

HC, Health care index; *DP*, Disease prevention index; *HP*, Health promotion index; *GHL*, General Health Literacy Index; *AO*, Index of ability to obtain health information; *AU*, Index of ability to understant health information; *AE*, Index of ability to evaluate health information; *AA*, Index of ability to apply health information.

Table 7 Comparison of health literacy indices of subjects who had received and who had not received maternal skills training

Variables (indices)	Attended maternity skills training ($n = 120$), mean ± SD	Did not attend training in maternity skills ($n = 380$), mean ± SD	*T*	*DF*	*P*
Health care	33.86 ± 6.21	32.42 ± 5.71	2.354	498	0.019*
Disease prevention	34.92 ± 7.03	29.38 ± 7.71	7.007	498	< 0.001*
Health promotion	31.64 ± 7.60	28.42 ± 6.84	4.360	498	< 0.001*
General Health Literacy Index	33.46 ± 6.20	30.14 ± 5.83	5.362	498	< 0.001*
Ability to obtain health information	34.26 ± 7.51	28.46 ± 8.15	7.227	214.743	< 0.001*
Ability to understand health information	36.57 ± 7.19	32.27 ± 6.01	5.933	174.598	< 0.001*
Ability to evaluate health information	30.92 ± 7.14	29.19 ± 6.80	2.404	498	0.017*
Ability to apply health information	32.22 ± 6.41	30.95 ± 5.47	1.958	177.142	0.052

*indicates significance

Discussion

The results of this study showed that less than one-third of mothers of newborns in the Vilnius Perinatology Centre have sufficient health literacy. The proportion of mothers with inadequate health literacy is 16.4%, and these outcomes are marginally poorer than those obtained from mothers residing in Hungary (where the proportion of women with inadequate health literacy is 15.5%) (Lee et al. 2004). Female participants in the study rated themselves relatively lowest in terms of health promotion (31% have an inadequate level of health literacy), this can be explained by assumptions that perhaps information on the topic is not sufficiently available (there is more emphasis on illness prevention and understanding of specific diseases), the topic is not well publicized, and mothers are not adequately motivated to become involved. It can also be assumed that mothers find it more difficult (due to lack of time, financial situation, spouse/partner attitudes) to adapt their lifestyle in a way that has a positive impact on their health.

The relatively weakest maternal health information processing competency is the ability to evaluate health information. Lithuanian women under 29 years of age primarily search for health information on the internet, as found in previous studies (60.6% of respondents use this source of information); more than half (56.1%) of women aged 30–59 use the internet as a source of health information (Lee et al. 2018). The spread of health information on the internet has resulted in an increase of conflicting and continuously changing information, making assessing its credibility challenging.

Previous studies on the relationship between age and health literacy have shown conflicting results. Studies in Poland, Hungary, the Netherlands, and eastern Germany show that health literacy increases with age (Lee et al. 2004, Institute of Medicine (US) Committee on Health Literacy 2004); on the other hand, studies in Turkey and Spain show the opposite results (Levin-Zamir et al. 2016, Loraine et al. 2004). Lorini et al. (2018) found no significant associations. Our study found no statistically significant associations between mothers' age and their health literacy and health information processing indices. This can be explained by the assumption that younger pregnant women are more likely to to depend on academic knowledge, to participate in health training, and to make greater use of easily accessible sources of information (e.g., on the internet), while older women's health literacy increases with experience.

Table 8 Comparison of health literacy indices between subjects who had planned their last pregnancy and subjects who had not planned their last pregnancy

Variables (indices)	Planned the current pregnancy ($n =$), mean ± SD	Did not plan the current pregnancy ($n = 90$), mean ± SD	*T*	*DF*	*P*
Health care	33.37 ± 5.60	30.86 ± 6.45	3.697	468	< 0.001*
Disease prevention	31.30 ± 7.92	28.90 ± 7.18	2.635	468	0.009*
Health promotion	29.79 ± 6.71	27.25 ± 8.15	2.737	119.097	0.007*
General Health Literacy Index	31.53 ± 5.77	29.06 ± 6.70	3.538	468	< 0.001*
Ability to obtain health information	30.81 ± 7.99	27.26 ± 8.55	3.738	468	< 0.001*
Ability to understand health information	34.05 ± 6.36	30.59 ± 6.84	4.561	468	< 0.001*
Ability to evaluate health information	29.74 ± 6.63	29.49 ± 7.82	0.309	468	0.757
Ability to apply health information	31.79 ± 5.66	29.10 ± 5.59	4.061	468	< 0.001*

The findings of positive and statistically significant associations between mothers' education and their level of health literacy support the findings of previous research conducted in other European countries. Jordan and Hoebel (2015) and Tiller et al. (2015) discovered that individuals who had the least education were more likely to have inadequate health literacy (Moynihan 2015, Nutbeam et al. 2018); similar results were obtained in Spain for the Catalan population (Loraine et al. 2004). According to an Israeli study, health literacy has a high positive relationship with overall learning time (Peerson and Saunders 2009). According to a collaborative European study, health literacy is tightly linked with the proportion of the population with secondary and higher levels of education (Lorini et al. 2018). Health literacy is assumed to be higher in more educated individuals, as educational institutions develop the cognitive skills necessary for health literacy: the ability to obtain, understand, assess, and apply information.

Mothers of newborns who received training in mothering skills were found to have higher health literacy than those who did not receive training. These results could be due to different reasons. Some researchers argue that the level of education of pregnant women plays an important role in helping them decide when to start antenatal visits, whether to attend health education classes and training sessions provided by midwives and nurses (Sántha 2021). Since this study discovered a link between a mother's education and her level of health literacy, as well as between a mother's education and attendance at maternal skills training, it is safe to believe that a woman's education is the most important component in this scenario. On the other hand, it is possible that maternal skills training contributes to pregnant women's health literacy as well: it not only gives key information on pregnancy, labor, breastfeeding, and newborn care, but it also makes finding the information you need during pregnancy and the postnatal period easier, as well as assessing the reliability of health information better.

This study found that multiparous women had significantly higher indices of ability to evaluate health information than primiparous women. This suggests that women's health literacy skills improve as a result of pregnancy and child raising experience, as well as regular visits to antenatal care professionals and involvement in maternity skills training (Javtokas and Žagminas 2013). Lee et al. (2018) found that a higher number of children is associated with lower parental health literacy (Jordan and Hoebel 2015). According to our study, women with 4–6 children had the lowest level of health literacy compared to women with fewer children. This can be linked to the fact that women in this group had lower overall levels of education; another possible reason is that low health literacy is linked to other interdependent factors: with lower levels of education (Moynihan 2015, Nutbeam et al. 2018, Peerson and Saunders 2009), the poorer socio-economic situation (Jordan and Hoebel 2015), or an increased risk of unplanned pregnancy (Tiller 2015, Thongnopakun et al. 2018).

It was discovered that mothers who planned their last pregnancy had greater health literacy than those who did not. On the one hand, this is due to their superior ability to plan pregnancies (Tiller 2015, Thongnopakun et al. 2018); on the other hand, with greater preparation for pregnancy and childbirth, women with higher health literacy levels are more motivated to seek information related to pregnancy and childbirth (Valero-Chillerón et al. 2021, WHO 1998) — they attend maternal skills training more frequently, strengthening their health literacy abilities.

Conclusion

The majority of women giving birth at the Vilnius Perinatology Centre lack adequate health literacy. The proportion of mothers with an inadequate level of health literacy is 16.4%. This study revealed no significant relationship between mothers' age and their level of health literacy, but it did demonstrate that health literacy is connected to the learning experience, higher education, and training in maternity skills. When the health literacy scores of married mothers were compared to those of unmarried mothers living with a partner, no statistically significant differences were discovered. Mothers with three children had higher health literacy in two categories (health care and the ability to assess health information) than mothers with one or two children. In this study, women with more than three children had the lowest health literacy. Pregnancy planning was also found to be associated with higher levels of health literacy.

Authors' contributions Alma Gaupšienė — conceived and designed the analysis, collected the data, wrote the main part of the paper.
Rasa Valančiūnaitė — performed data analysis.
Jekaterina Baglajeva — wrote a part of the paper.
Aistė Vainauskaitė — wrote a part of the paper.
Prof. Rimantas Stukas — provided advice and suggestions.
Prof. Diana Ramašauskaitė — provided advice and suggestions.
Dr. Virginija Paliulytė — provided advice and suggestions.
Prof. Natalja Istomina — conceived and designed the analysis, provided advice and suggestions.

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Declarations

Conflicts of interest/Competing interests We wish to confirm that there are no known conflicts of interest associated with this publication, and that there has been no significant financial support for this work that could have influenced its outcome.

Ethics approval We confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies, and that such approvals are acknowledged within the manuscript.

In order to carry out a biomedical study, the Vilnius Regional Committee for Biomedical Research Ethics instructed us to prepare the following documents: the protocol, a summary of the protocol, informed consent form, ethical evaluation, an application to conduct an investigation. Biomedical research authorisation granted 21-03-2022 after fulfilling all requirements — No. 2022/3-1418-887.

Consent to participate The Informed Consent Form (ICF) had to be signed by the respondent (subject — newborn's mother) and by the newborn's father. ICF was provided with information about the biomedical study and the researchers involved. Respondents were explained what data would be collected during the survey. The possibility of withdrawing from the study was explained.

Consent for publication Not applicable.

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