

IMPACT OF HEALTH LITERACY AND SEXUAL BEHAVIOR ON UNPLANNED PREGNANCY AND ABORTION

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It has been proven that health education is directly related to numerous decisions of young people regarding their reproductive health and sexual behavior. The aim of this paper is to evaluate the impact of health literacy and sexual behavior on the occurrence of unplanned pregnancies and abortions among young girls.

We used STOFHLA to assess the health literacy level of young females and a questionnaire to collect socio-demographic characteristics of respondents and their behavior in the area of reproductive health. Descriptive statistics were presented in percentages, and a chi-square test was performed to assess the existence of correlation between categorical variables using SPSS. A total of 220 female respondents were included. The levels of health literacy were as follows: adequate literacy was observed in 78.2% of participants, marginal literacy in 15.9%, and inadequate literacy in 5.9%. Unplanned pregnancies occurred in 7.3%, and all respondents had an abortion. The chi-square test confirmed the existence of a connection between health literacy and unplanned pregnancies, abortions, and the age of the respondents.

The frequency of sexual intercourse and the use of contraceptives showed a statistical association with unplanned pregnancy/abortion.

Education of young people about sexual behavior needs to be an imperative of health institutions, and it is necessary to carry out more effective education at elementary school and high school. Good health literacy is a prerequisite for good reproductive knowledge.

Keywords: health literacy, reproductive health, young women, prevention, abortion

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INTRODUCTION

Health literacy plays a crucial role in shaping individuals' understanding and making decisions regarding various aspects of healthcare, including reproductive health (1). Adequate education on reproductive health significantly influences the well-being and life outcomes of young girls. (2). Knowledge and prevention of unplanned pregnancy or abortion are in close relation to the sexual education of young minds, which should start before puberty. For young girls, the level of health literacy can significantly influence their awareness, access, and attitudes toward abortion; moreover, it ensures that individuals are well informed before becoming sexually active. (3, 4). Health literacy encompasses the ability to obtain, comprehend, and apply health-related information to make informed decisions about one's well-being (5). When it comes to abortion, a complex and sensitive issue, young girls with higher levels of health literacy are more likely to make informed choices, seek appropriate medical advice, and navigate the legal, emotional, and physical dimensions of the decision-making process effectively (6). Many unplanned pregnancies among young people are followed by abortion. Such interventions can influence not only outcomes that may manifest later in adult life, such as infertility or difficulties in maintaining a pregnancy, but, in many cases, mental health may be significantly compromised shortly after the abortion procedure (7). There is a high risk of developing mental health disorders, including anxiety and depression, and in some cases even suicidal behavior, often as a consequence of stigmatization and feelings of being judged.

Conversely, limited health literacy can lead to confusion, misinformation, and poor decision-making, which may increase the risks associated with unsafe abortions, inadequate post-abortion care, and emotional distress (8). Understanding how health literacy impacts the reproductive choices of young girls, particularly in relation to abortion, is essential for developing targeted educational and healthcare interventions (9). This knowledge can empower young individuals to make well-informed choices, ensuring their safety, well-being, and access to appropriate healthcare resources (10).

Sexual behaviour can be defined as the process through which humans and other species demonstrate or express aspects of sexuality, encompassing a broad range of activities related to reproduction, social bonding, and emotional expression (11). The influence of sexual activity and contraceptive use on accidental pregnancies among

young girls is a crucial issue in public health as well as in social science. Adolescent pregnancy rates remain a significant concern globally, particularly in areas where access to comprehensive sexual education and contraceptive methods is limited (12). Young girls, often in their teens, may face physical, emotional, and social challenges if they experience unintended pregnancies, which can alter their life trajectories (13). Sexual activity among adolescents is often coupled with limited awareness of reproductive health and contraceptive options, leading to higher risks of unplanned pregnancies. Additionally, despite the availability of contraception, inconsistent or incorrect use, along with barriers such as stigma, misconceptions, and limited access, can contribute to contraceptive failure (14). This issue requires a nuanced understanding of how sexual behaviours and contraceptive practices intersect to shape outcomes for young girls (15). Understanding these factors is essential for developing effective policies, educational programs, and health interventions to reduce the incidence of accidental pregnancies and promote healthier reproductive choices (16).

This work aimed to assess the influence of health literacy and sexual activities of young girls on the occurrence of accidental pregnancy and abortions in the Serbian population.

METHODS

This research was conducted as a cross-sectional observational study among female students of the College of Health in Belgrade from November 2023 to February 2024. After the lectures, female students had the opportunity to complete the survey with voluntary consent, with the assistance of the teacher (surveyor) as needed, for a duration of 12 minutes for STOFHLA and approximately 10 minutes for the questionnaire about general information and sexual behavior.

As instruments of research, the following questionnaires were used:

1. STOFHLA population - Short Test of Functional Health Literacy in Adults - test of functional health literacy among the adults (an abbreviated version of the questionnaire TOFHLA (STOFHLA) that consists of 36 parts, which assesses the ability to read and understand information from the health care environment)
2. General information questionnaire of respondents who referred to the demographic, social, and economic characteristics of respondents, health knowledge, and

sexual behaviour.

Respondents were introduced to the research objectives and procedures before beginning. Ethical standards were aligned with the International Declaration of Helsinki (Declaration of Helsinki). To ensure the privacy of research subjects and the confidentiality of information collected about them, all necessary steps were taken in accordance with the General Data Protection Regulation (GDPR). Signed informed consent for participation in the research was obtained from each respondent. The study protocol was reviewed and approved by the Ethics Committee of the Academy of Applied Studies Belgrade (Approval No. 01-577/6).

The research included respondents aged 18 to 30. Only fully completed questionnaires were considered valid; incomplete and/or partially filled questionnaires were excluded. The questionnaires were completed anonymously under the supervision of a teacher from the institution, and no additional interventions were required for data collection. The study focused on a group of young people, aiming to assess sexual behavior and activity in relation to health literacy levels and their impact on unplanned pregnancy and/or abortion.

TOFHLA has already culturally adapted to the Serbian language and shows good internal consistency (Cronbach's $\alpha = 0.94$) (17). A perfect score on the literacy test was 36 points, and it took 7 minutes to administer.

The definition of health literacy levels and associated scores were as follows:

1. Inadequate health literacy implied the impossibility of reading and understanding the text related to health, with points between 0 and 16.
2. Marginal health literacy refers to the difficulty in reading and understanding the health-related text with points between 17 and 22.
3. Adequate health literacy is the ability to read and understand most of the health-related text, with points between 23 and 36.

Questions about sexual behaviour consisted of the following:

1. Are you sexually active?
2. How often do you have sex?
3. What type of contraception do you use most frequently?
4. Did you or your partner have experience with an unwanted pregnancy?
5. Did you or your partner have experience with abortion?

The study employed a purposive sampling approach targeting female students, who were invited to voluntarily

complete the survey after being informed about the study's objectives and procedures. The minimum required sample size was determined using the G*Power software for a chi-square test, with parameters set at $\alpha = 0.05$, statistical power $(1-\beta) = 0.95$, and effect size $w = 0.3$, yielding a calculated sample size of 220 respondents.

The following statistical analyses were performed: measures of central tendency, including the mean and median, and measures of variability. The following statistical analyses were conducted: measures of central tendency, including the mean and median, and measures of variability, specifically the standard deviation, were calculated for continuous variables. For categorical variables, the results were presented as proportions or percentages. A chi-square test was performed to assess the correlation between categorical variables. Significance was noted whenever the p-value was less than 0.05. Statistical Package for the Social Sciences (SPSS), version 23, was used to perform these tests.

RESULTS

In this research, 220 female respondents participated, the majority of them 20 years old or younger (72.7%). The average age of respondents in this study was 20.2 ± 1.5 . It was assessed that health literacy was adequate in 78.2%, marginal in 15.9% and inadequate in 5.9% (Figure 1).

We wanted to determine the impact of health literacy on sexual behaviour and the occurrence of unplanned pregnancies and abortion. Health literacy was found to be significantly different in the two examined age groups ($p = 0.03$). Younger respondents had more inadequate and marginal health literacy compared to the older group, and a lower level of health literacy. Considering the frequency of sexual intercourse, no significant difference was found in different levels of health literacy ($p = 0.213$). Most respondents reported having sexual intercourse several times per week (81.5%), and the majority of them demonstrated an adequate level of health literacy. Health literacy levels did not have a significant impact on the choice of contraceptive methods ($p = 0.783$); however, the most commonly used contraceptive method was the condom (64.6%). A concerning finding was that 17.5% of respondents reported using the withdrawal method of contraception (coitus interruption), although 86.1% of these individuals had adequate health literacy. Additionally, 8.3% of respondents reported not using any contraceptive method. The influence of health literacy on unplanned pregnancy and abortion showed a statistically

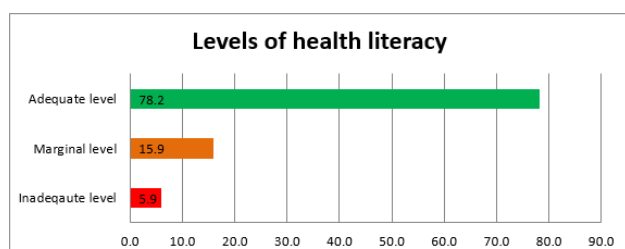


Figure 1. Levels of health literacy among young female respondents

significant correlation ($p = 0.047$), with 7.3% of respondents reporting having experienced this situation. All respondents within this group reported having undergone an abortion, and 56.3% of them had an adequate level of health literacy (Table 1).

As all respondents (100%) with an unplanned pregnancy had an abortion, we wanted to examine the connection with sexual behaviour. It was found that the frequency of sexual intercourse had a significant impact on unplanned pregnancy, and the most unwanted pregnancies occurred in the respondents having sexual intercourse multiple times per week or once a week ($p = 0.021$). Having sexual intercourse more regularly increased the chance of having an unplanned pregnancy and vice versa, whereas respondents who had sexual intercourse once a month, a couple of times a year, or once a year never had an unplanned pregnancy. Unplanned pregnancy also had a significant correlation with contraception choice ($p = 0.014$). The highest number of unplanned pregnancies occurred in the respondents using an inadequate type of contraception, the withdrawal method, or no contraception (Table 2).

DISCUSSION

Contemporary research on health literacy demonstrates trends similar to those observed in the present study, particularly with regard to differences in health literacy levels between younger and older populations. For example, in studies conducted in Portugal, researchers found that the level of health literacy in Portugal was generally high, but it was associated with an individual's socioeconomic status (18, 19).

A study from Italy showed that students performed better in health literacy compared to the public sector employees (20). Additionally, data from a study conducted in Italy indicated that students had lower levels of health literacy compared with those in other countries, highlighting the

need to improve health education within school settings (21). The findings further suggest that older individuals who often have lower socioeconomic status and lower educational attainment tend to demonstrate lower levels of health literacy. This may result from limited exposure to health education programs and insufficient digital literacy, which is frequently associated with lower levels of general literacy. A similar study conducted in Hungary in 2021 showed that older generations have a weaker ability to make informed decisions about their health, which was attributed to their lower educational status, emphasizing the need for programs that focus on prevention and public health (22).

On the other hand, older people, who are more often faced with health problems, show better results when it comes to understanding and using health information. This trend was confirmed by a 2022 study in Slovenia, which showed that older people, compared to younger individuals, have better health literacy, likely due to longer exposure to health services and information, as well as greater interest in health-related topics (23).

Recent research on health literacy and adolescent sexual behavior provides a clearer understanding of the complex relationship between these factors. A systematic review from 2017 indicates a significant association between health literacy and health behaviors in adolescents, indicating that a higher level of health literacy can contribute to healthier decisions regarding sexual behavior (24).

Our results showed that the level of health literacy did not have a significant influence on the choice of contraceptive methods among the respondents. The most frequently used method was the condom, while approximately 18% of respondents with an adequate level of health literacy relied on the withdrawal method as a form of contraception. These findings are consistent with a study conducted among students at the University of Zagreb, which showed that while students had good knowledge of the preventive effects of regular contraceptive use, their understanding of emergency contraception and the non-contraceptive benefits of contraceptives was more limited. The research also showed that informing students through comprehensible professional literature significantly affects the regular use of contraception (25).

Although our research did not show a significant association between health literacy and the choice of contraception, it is worrying that a high percentage of respondents with adequate health literacy use less reliable methods, such as the withdrawal method (coitus

Table 1. Descriptive statistics of observed variables and chi-square test of influence of health literacy on each individual variable

	Descriptive statistics		Health literacy levels			Chi-square test	
	Number	Percentage	Inadequate	Marginal	Adequate	Pearson Chi square value	Significance
Age Group							
To 20 years	160	72.7	12 (7.5%)	30 (18.8%)	118 (73.8%)	6.963	0.031*
Above 20 years	60	27.3	1 (1.7%)	5 (8.3%)	54 (90.0%)		
Frequency of sexual intercourse							
everyday	8	4.0	0 (0%)	2 (25%)	6 (75%)	20.155	0.213
more times per week	65	32.5	5 (7.7%)	7 (10.8%)	53 (81.5%)		
once a week	21	10.5	2 (9.5%)	1 (4.8%)	18 (85.7%)		
more times per month	48	24.0	0 (0%)	6 (12.5%)	42 (87.5%)		
once a month	31	15.5	2 (18.2%)	5 (16.1%)	24 (77.4%)		
more times per year	11	5.5	2 (18.2%)	0 (0%)	9 (81.8%)		
once per year	3	1.5	0 (0%)	2 (66.7%)	1 (33.3%)		
once in couple years	2	1.0	0 (0%)	0 (0%)	2 (100%)		
never	11	5.5	1 (9.1%)	2 (18.2)	8 (72.7)		
The most used contraceptives							
stopped ejaculation	36	17.5	2 (5.6%)	3 (8.3%)	31 (86.1)	4.764	0.783
condom	133	64.6	7 (5.3%)	17 (12.8%)	109 (82.0%)		
anti-baby pill	17	8.3	1 (5.9%)	4 (23.5%)	12 (70.6%)		
pill for the next morning	3	1.5	0 (0%)	1 (33.3%)	2 (66.7%)		
don't use contraception	17	8.3	2 (11.8%)	2 (11.8%)	13 (76.5%)		
Unplanned pregnancy							
Yes	16	7.3	2 (12.5%)	5 (31.3%)	9 (56.3%)	6.333	0.047*
No	204	92.7	11 (5.4%)	30 (14.7%)	163 (79.9%)		
Abortion							
Yes	16	7.3	2 (12.5%)	5 (31.3%)	9 (56.3%)	6.333	0.047*
No	204	92.7	11 (5.4%)	30 (14.7%)	163 (79.9%)		

*Statistically significant value, less than 0.05

Table 2. Influence of frequency of sexual intercourse and contraceptives on unplanned pregnancy

	Unplanned pregnancy		Chi-square test	
	Yes	No	Pearson Chi square value	Significance
Frequency of sexual intercourse				
everyday	0 (0%)	8 (100%)	18.005	0.021*
more times per week	3 (4.6%)	62 (95.4%)		
once a week	3 (14.3%)	18 (85.7%)		
more times per month	1 (2.1%)	47 (97.9%)		
once a month	0 (0%)	31 (100%)		
more times per year	0 (0%)	11 (100%)		
once per year	0 (0%)	3 (100%)		
once in couple years	1 (50%)	1 (50%)		
never	0 (0%)	11 (100%)		
The most used contraceptives				
stopped ejaculation	4 (11.1%)	32 (88.9%)	12.500	0.014*
condom	2 (1.5%)	131 (98.5%)		
anti-baby pill	1 (5.9%)	16 (94.1%)		
pill for the next morning	0 (0%)	3 (100%)		
don't use contraception	3 (17.6%)	14 (82.4%)		

*Statistically significant value, less than 0.05

interruption), or do not employ any form of contraception. A study conducted in South Africa analyzing the most commonly used contraceptive methods showed that condoms, injectable contraceptives, and pills were the most frequently used methods, along with periodic abstinence. The main reasons for not using contraception were being unmarried, having irregular sexual activity, or not being sexually active (26). A systematic review, partly focused on analyzing the most commonly used contraceptive methods, showed that women most frequently use intrauterine devices (IUDs), contraceptive

patches, implants, pills, condoms, and intercourse on non-menstrual days (27).

Our results showed a significant correlation between unplanned pregnancy and the choice of contraception, with the highest number of unplanned pregnancies recorded among respondents who used inadequate methods of contraception, such as coitus interruptus or did not use contraception at all. These findings are consistent with research conducted in Iran, where it was found that inadequate health literacy can lead to improper use of contraceptive methods and an increased risk of unplanned pregnancy (28). Unwanted pregnancies most often occur due to non-use, incorrect use, or inconsistent use of contraception, as indicated by the results of our study. The most commonly used reversible methods of contraception are oral contraceptive pills and condoms. Condoms have an annual failure rate of 9% and 18%, while pill failures are twice as high among women under 21, contributing significantly to the risk of teenage pregnancy. The use of intrauterine methods (IUDs) and implants has the lowest reported rate of unplanned pregnancy, less than 1% (29).

In a survey of 21 countries, with a complete insight into the rate of termination of pregnancy, it was shown that pregnancies in the period of 15-19 years are most common in America, least common in Switzerland, and relatively high in the former Soviet states. The percentage of unwanted pregnancies that ended in abortion varies from 17% in Slovenia to 69% in Sweden (30). Given the population data of the countries examined, it can be concluded that a large percentage of unwanted pregnancies result in abortion, which aligns with the findings of our study.

Since the process of terminating a pregnancy can be a very traumatic experience for young people, it is crucial that they have an adequate support system from family and their environment. Such experiences can have long-term consequences, particularly by lowering self-esteem, affecting mental health, and increasing the risk of anxiety and depression (31). Prevention of unwanted pregnancies through adequate information, destigmatization, and educational programs on contraceptive methods can help reduce the occurrence of unwanted pregnancies, abortions, and potential complications affecting reproductive and overall health.

Limitations

This study has several limitations. Its cross-sectional design precludes establishing causal relationships

between health literacy, sexual behavior, and reproductive outcomes. The sample was restricted to female students from a single health college in Belgrade, limiting the generalizability of the findings to broader populations. Data were self-reported, which may introduce recall bias and social desirability bias, particularly given the sensitivity of topics such as sexual activity, contraception, and abortion.

CONCLUSION

The results of our research, in accordance with studies conducted in the world, indicate that health literacy is not always a decisive factor in sexual behavior and the choice of contraception used among young people. Although the condom was most commonly used, it is worrying that a significant percentage of respondents used inadequate contraceptive methods, such as the withdrawal method (coitus interruption), which was associated with a higher rate of unplanned pregnancies. Similar trends have been observed in international studies, which emphasize the need for more comprehensive health education programs. These interventions should focus on improving young people's knowledge and skills in using health information, especially in the context of sexual and reproductive health.

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Statement of Ethics

The study protocol was reviewed and approved by the Ethics Committee of the Academy of Applied Studies Belgrade (Approval No. 01-577/6). Complete written informed consent was obtained from the respondents for the publication of this study.

Competing Interest

The authors declare no relevant conflicts of interest.

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