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RELATIONSHIP BETWEEN EDUCATION OF PREGNANT WOMEN AND LISTENING TO CLASSICAL MUSIC WITH THE EXPERIENCE OF PAIN IN CHILDBIRTH AND THE OCCURRENCE OF PSYCHOLOGICAL SYMPTOMS IN PUERPERIUM

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SUMMARY

Introduction: *Pregnancy is a unique experience accompanied by significant physiological, biochemical, and psychological changes that may affect a woman's mental health status. With the development of a holistic approach, midwives have become continuous support during pregnancy and childbirth. Childbirth education is an intervention that affects delivery outcomes and the experience of childbirth. Music therapy has been proven to be a safe and effective non - pharmacological method to gain in pregnancy and puerperium. The study aimed to prove the impact of educating pregnant women and listening to classical music on the experience of childbirth pains and the occurrence of psychological symptoms during puerperium.*

Methods: *A prospective randomized controlled trial (n=198) was conducted. The experimental group of pregnant women was educated during pregnancy and listened to classical music the rest of the pregnancy, while the control group received the usual care. The VAS scale was used to assess pain, and the 90 - point scale was used to assess the incidence of psychological symptoms.*

Results: *The difference in pain assessment between the experimental and control groups was significant ($p<0.001$). The experimental group rated their childbirth pain as moderate (M=5.98), while the control group experienced severe pain (M=8.42). A significant difference in the incidence of psychological symptoms between groups was found in the dimensions of interpersonal sensitivity, hostility, phobic anxiety, and paranoid ideations ($p=0.042$; $p=0.014$; $p=0.013$; $p=0.008$).*

Conclusion: *This study demonstrated the impact of midwifery education and listening to classical music on the perception of childbirth pain and mental health in the puerperium. The experimental group rated childbirth pain significantly lower compared to the control group and had significantly fewer psychological symptoms 6 weeks after delivery.*

Key words: *pregnancy - midwifery education - music therapy - childbirth pain - mental health*

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INTRODUCTION

In a woman's life, pregnancy is a unique experience accompanied by significant physiological, biochemical, and psychological changes that can affect mental health status (Alderdice et al. 2013). One - fifth of pregnant women experience problems with mental functioning before or after childbirth, and while most overcome difficulties within a year, some disorders take a chronic form (Austin et al. 2008). James Hawkins et al. (2019) state that pregnant women in the Arab world are more likely to experience mental health disorders if they are exposed to financial stress or have a lower educational status.Also, differences in the quality of health care provided have a significant impact on the mental health of pregnant women. A study (Patabendige et al. 2020) among 300 health professionals in maternity hospitals in Sri Lanka found that there is good knowledge and awareness among the surveyed staff about the importance of mental health of pregnant women and new mothers, but there is no practical action, which is confirmed by the high prevalence of postpartum depression among new mothers in the examined areas. The most common mental disorder in pregnancy and postpartum is depression (Legere et al. 2017). About 20-40% of women report some emotional disorders or cognitive dysfunction in the postpartum period. The risk of depression is increased in unwanted pregnancies, unplanned pregnancies as well as negative reactions of partners or families to pregnancy (Leon 1992). Psychoanalytic theories, in the context of depression in pregnancy, emphasize the importance of the psychological triggering of a previous abortion (Stotland 1998). Women with their children can stay in specially arranged rooms under supervision so that the mother - newborn relationship is not disturbed due to the disease, which is important for both the mother and the child in its earliest stages of development (Chabrol et al. 2002). Postpartum is a period in which women are at increased risk of developing serious mental disorders. It was found that women who

participate in the implementation of preventive activities have a better emotional status in the postpartum period (Hotujac 2009). Childbirth education is an intervention that has a major impact on delivery outcomes and the experience of childbirth (Levett et al. 2016). The scientific literature on childbirth education and its effects is limited. Evidence of this is Cochrane's systematic review in which Gagnon (2007) states that the effects of antenatal education on childbirth and parenthood are quite unknown. With the development of a holistic approach, midwives have become continuous support during pregnancy and childbirth (Najafi et al. 2017) to achieve satisfaction with the experience of childbirth and increasethe mother's self-confidence (McEvoy & Duffy 2008). Pan et al. (2018) confirmed the impact of midwifery education on psychosocial health on a sample of 104 women, divided into experimental and control groups. Pregnant women in the experimental group attended an eight - week education program and used audio recordings at home, and had statistically significantly lower levels of stress and depression compared to the control group. A woman's response to pregnancy and childbirth is individual and often determined by her cultural background, so modern midwifery care must be individual and tailored to the needs of each pregnant woman. A study from Australia found in a sample of 300 mothers (Vietnamese, Turkish and Australian), all of whom gave birth at the same time in an Australian city hospital, that the experience of childbirth was different as well as coping with pain. All women had a natural vaginal birth and gave birth to a healthy child, but Vietnamese women had more self – confidence, less anxiety, and panic compared to the other two groups. Australians and Turks used more relaxation and breathing techniques but expressed greater dissatisfaction with childbirth (McLachlan & Waldenstrom 2005). Pregnant women in some countries do not have the opportunity to be educated about pain relief techniques, nor do they have the conditions to use them during childbirth. The general attitude of health care providers in maternity hospitals in Ethiopia is that childbirth is a natural process and that a woman must find a way to get through it all, and that pain relief is not a priority in care. Most of the health professionals surveyed were aware that the woman was suffering from pain, but stated that they were reluctant to use pharmacological preparations to reduce pain (McCauley et al. 2017). A review of the literature published in a study of Brazilian midwives between 2002 and 2012 found that midwives in Brazil use methods to relieve pain. They encourage women to use the birth ball, educate them on breathing techniques, massage with essential oils, and allow free movement in the first stage of childbirth (Vargens et al. 2013).

A randomized clinical trial conducted by Yuksel et al. (2017) on a sample of 250 pregnant women demonstrated a statistically significantly lower perception of pain in an experimental group that underwent a series of breathing exercise training compared to the control group, and the VAS scale was used to assess pain. The interaction of music and the psyche has been a phenomenon since ancient times and has been used for healing purposes ever since (Gantenbein 1999). Among various ancient cultures, music was believed to heal the mind and body (Thaut 2015). Although from a historical perspective, science and music are two completely separate entities, the digital revolution is changing that relationship by uniting biology, science, and music. Their mutual interaction in the human brain becomes a path to healing (Jakovljević & Jakovljević 2021). Today, music plays an important role in psychotherapy, therapeutic pedagogy, and medical care (Gasenzer & Neugebauer 2011). However, the question that preoccupies music researchers today is why music is so valued and an important feature of all known living cultures and societies (Dukić & Jakovljević 2021). The influence of music on the animal world is also proven by Wisniewska et al. (2019) in whose study multiple exposures to music in horses had a relaxing effect, while in rats euthanized after listening to 8 sessions of Mozart's music found changes in brain activity in terms of increased dopamine levels compared to a group of rats who did not listen to music et al. 2018).

The relationship between music and pain is still a wide and open study field with questions about the role of dopamine and pain processing while listening to music. Pain and music are thought to meet in the thalamus and limbic field (Gasenzer & Neugebauer 2014). The potential of music to affect dopamine, serotonin, and oxytocin levels can lead to positive emotional reactions that are directly related to strengthening psychological status (Dukić 2018). Music therapy has been confirmed as a safe and pleasant non-pharmacological method for pregnancy and midwifery, and the therapeutic effects of listening to music on maternal and child health have been proven in numerous studies that do not specify the type of music used in methodologies (Hollins 2014, Simavli et al. 2014). Lower incidence of anxiety and depression in women, lower perception of pain during childbirth, higher oxygen saturation in the newborn, and longer breastfeeding were found. A unique package with selected music is not defined, but the choice is left to the creativity and knowledge of health professionals (Hollins 2014). The study by Simavlija et al. (2014) found a statistically significantly lower level of pain and anxiety in the study group of 80 first - borns who listened to the music of their choice during childbirth compared to the control group who underwent childbirth without listening to music.

The effect of listening on stress, depression, and anxiety was also found in pregnant Taiwanese women, randomized into two groups. The experimental group listened to music for two weeks and had better results in all measurements compared to the control group that did

not listen to music. The results confirmed the psychological benefits of listening to music and indicated the need to investigate the effects of long - term listening (Chang et al. 2008). A review of the available databases did not find any study conducted in Bosnia and Herzegovina and the wider region on the impact of music on the experience of pregnancy, childbirth, or mental health in the postpartum. Therefore, the combination of music and health sciences represents an open study area whose results can significantly contribute to the emotional and psychological well - being of pregnant women. The study curiosity in midwifery, and the merging of art and profession through the introduction of music therapy in the context of midwifery education, create an alternative to the current standard midwifery care. All of the above leads to the strengthening of the midwifery profession, reducing the total cost of services related to childbirth, but also strengthening the quality of life of families in this area, which is the most important goal.

The aim of this study was to prove the impact of educating pregnant women and listening to classical music on the experience of childbirth pain and the occurrence of psychological symptoms 6 weeks after delivery.

METHODS

Study Design

A prospective randomized controlled trial was conducted at the Cantonal Hospital „Dr. Fr. Mihovil Sučić“ in Livno, the Women's Dispensary of the Livno Health Center, and the Vrdoljak Private Gynecological Practice in Livno, Bosnia and Herzegovina. The time of conducting the study was from January 1, 2019, to October 1, 2019. The study protocol was registered at Clinicaltrials.govunder NCT04104009.

Ethical approval

The study was reported to the competent Ethics Committees of the County Hospital „Dr fra Mihovil Sučić" Livno (Ethics Committee is joint for the Cantonal Hospital "Dr fra Mihovil Sučić", Health Center Livno and the Public Health Institute of Herceg-Bosna Canton) and the Faculty of Health Studies in Mostar.

Participants

The sample consisted of 198 participants (n=198), pregnant women from the Hercegbosna Canton. The sample was convenience - pregnant women in the second and third trimesters of pregnancy who gave birth in the maternity ward of the Cantonal Hospital „Dr fra Mihovil Sučić" Livno in the period from mid - February 2019 to mid - August 2019. Randomization participants were divided into an experimental group in which group education was conducted, application of breathing exercises and listening to classical music, and a control group that spent pregnancy without education, listening to classical music and breathing exercises. After the completion of the training program with the experimental group, there was a break of 5 weeks during which a new experimental and control group was formed. The procedure was carried out until the predicted sample size was met (99 participants per group).

Criteria for inclusion in the study were: all pregnant women from Herceg-Bosna County who controlled their pregnancy in the competent health centers and private gynecological practice.

Exclusion criteria were: underage pregnant women, pregnant women in the first trimester of pregnancy, pregnant women after the 34th week of pregnancy, multiple pregnancies, pregnant women who had a history of cesarean delivery, pregnant women with a psychiatric diagnosis, high - risk pregnancies, incomplete and / or incomplete questionnaires, pregnant women who did not listen to classical music as agreed, the birth of a stillborn child.

Measuring instruments

The Visually Analogous Pain Scale (VAS) is a one - dimensional instrument that subjectively assesses pain intensity. It consisted of a 10 cm (100 mm) long line, and the centimeter line was used in this study. Next to the numbers next to the scale are verbal descriptions of pain. The number zero indicates the absence of pain, and the number ten the highest intensity of the pain (Appendix 1) (Woodforde & Merskey 1972).

The Symptom Checklist - 90 (SCL-90) is a valid measuring instrument for assessing psychological symptoms resulting from stress. The scale consists of 90 questions that the participant answers by assessing on a four-point scale (from 0 - not at all to 4 - distinctly) the level of discomfort aroused in him by the described symptom. The SCL - 90 scales were defined to measure nine primary symptom dimensions and three global stress indices (Appendix 2) (Derogatis et al. 1973).

Intervention

After the randomization procedure, group education of pregnant women was conducted through four meetings lasting one hour. The training program included: teaching the basics of childbirth physiology, visiting the Department of Childbirth to reduce fear of childbirth, adopting the practice of deep inhalation and exhalation used in the first stage of childbirth, applying the technique of listening to classical music of your choice that continued until pregnancy daily (in the evening before bedtime, lasting 15 minutes), teaching and applying techniques for successful breastfeeding,

maternal and child health care after childbirth. The time of listening to the music was chosen on the assumption that the greatest need for relaxation was at the end of the day, and the length of 15 minutes was estimated as a sufficiently short but effective intervention. At the end of the program, the educator arranged with the respondents a weekly check - up by phone (for the quality of communication) to inform them about adherence to the agreed listening to classical music. Each (non) compliance was recorded in a record specifically intended for the needs of the study.

Pregnant women who did not meet the agreed plan were excluded from the study. The day after delivery, each participant in the experimental and control groups was given a pain assessment questionnaire (VAS) on which they evaluated their overall experience of childbirth pain. It was agreed to send SCL - 90 after 6 weeks of delivery, and mothers were asked to respond to the same within a week. Any respondent who did not respond to the questionnaires within a week was asked once again by email. The waiting time for a response has been extended from one to two weeks. If there was no response by then, participants were excluded from the study.

Statistical analysis

Data were collected in an MS Excel database (version 11. Microsoft Corporation, Redmond, WA, USA), and statistical analysis was performed with the statistical program SPSS 20.0 (IBM Corp., Armonk, NY, USA). Data were processed by descriptive statistics methods, categorical variables were presented as frequency and percentage, while continuous variables were presented as the arithmetic mean and standard deviation. The Hi square test was used to test the differences between categorical variables, while the t - test for independent samples was used to analyze the differences between continuous variables. The association between risk factors was examined by Pearson's correlation coefficient. The probability level of $p < 0.05$ was taken as statistically significant.

Sociodemographic characteristics of the sample

The final sample included in the data analysis consisted of 175 participants (n=175), mean age 31.1 years (M = 31.1; min = 20; max = 47; SD = 5.262). Out of that, there were 85 respondents from the experimental group (48.6%) who underwent group training, breathing exercises, and listening to classical music, and control group respondents who did not undergo the mentioned training during pregnancy, a total of 90 (51.4%). No significant age difference was found between the subjects of the control group (M = 30.9; SD = 5.374) and the experimental group (M = 31.4; SD = 5.160) (t = -0.627; df = 173; p=0.531). No significant differences were found in the number of surveyed women from the control and experimental groups living in urban or rural areas (χ^2=0.455; df=1; p=0.500). The majority of respondents were married (94.9%), while in the total sample there were 6 (3.4%) unmarried and 3 (1.7%) divorced pregnant women/mothers. No significant differences were found in the number of married women in the control and experimental groups, as well as in the distribution of participants in the groups concerning employment status (χ^2=1.996; df=1; p=0.158). There were no significant differences in terms of educational status between the observed groups. The largest number of participants in both groups were first - borns (n=66).

RESULTS

Pain assessment on the VAS scale between groups

Participants who underwent training reported significantly lower levels of pain according to the VAS scale than participants in the control group who did not undergo training ($p<0.001$) (Table 1).

Comparison of the incidence of psychiatric symptoms as measured by the SCL scale 6 weeks postpartum between groups

Participants in the experimental group reported lower levels of interpersonal sensitivity, hostility, phobic anxiety, and paranoid ideation compared to the control group. There were no significant differences in individual global stress indices between the two observed groups of participants (Table 2).

Significantly more participants from the experimental group stated that they had no psychological symptoms compared to the control group ($p<0.001$) and that there were significantly fewer of them in moderation compared to the control group. The controls also had significantly more responses related to "many" symptoms. No significant differences were found in the number of mothers/respondents in the control and test groups who stated that they had few or very many pronounced psychological symptoms. There was no significant difference in outcomes on individual symptoms, global stress indices, or subjective assessment of pain between mothers who had previously experienced spontaneous or intentional abortion compared to those who had not (Table 3).

Table 1. Comparison of pain intensity assessed using the VAS scale between study groups

Study group	n	M	SD	T	df	p
Experimental	90	8.42	1.514	8.863	173	<0.001
Control	85	5.98	2.104			

Table 2. Comparison of results on psychological symptom scales 6 weeks postpartum

	Group	M	SD	T	df	p
Somatization	Experimental	7.92	5.189	0.839	173	0.403
	Control	7.29	4.685			
Obsessiveness-compulsiveness	Experimental	5.71	4.182	1.329	173	0.186
	Control	4.91	3.810			
Interpersonal sensitivity	Experimental	4.51	4.128	2.052	166	0.042*
	Control	3.38	3.147			
Depression	Experimental	7.07	5.382	0.557	173	0.578
	Control	6.64	4.823			
Anxiety	Experimental	4.82	4.134	-0.335	173	0.738
	Control	5.02	3.795			
Hostility	Experimental	2.54	2.304	2.482	166	0.014*
	Control	1.78	1.769			
Phobic anxiety	Experimental	1.96	2.022	2.510	156	0.013*
	Control	1.31	1.354			
Paranoid ideation	Experimental	3.22	2.767	2.702	173	0.008*
	Control	2.13	2.572			
Psychoticism	Experimental	2.57	2.950	1.697	172	0.091
	Control	1.86	2.578			
Appetite and sleeping	Experimental	3.80	3.474	1.026	173	0.306
	Control	3.29	3.015			

Table 3. Frequency of individual intensities of psychological symptoms in the control and experimental groups

	Control group		Experimental group		χ^2	df	p
	n	%	n	%			
Not at all	5451	67.3	5378	70.3	16.359	1	<0.001
Little	1645	20.3	1579	20.6	0.2580	1	0.611
Moderately	739	9.1	510	6.7	32.575	1	<0.001
A lot	208	2.6	135	1.8	11.929	1	0.001
Extremely lot	54	0.7	47	0.6	0.170	1	0.680

Significant low positive correlations were found between subjective pain assessment assessments and global stress measures, as well as between the positive symptoms index and the global stress index (Table 4).

Results on the measure of subjective assessment of pain were significantly positively associated with almost all dimensions of symptoms, except for interpersonal sensitivity, depression, and psychoticism. Participants who had higher estimates of childbirth pain also scored higher on the scale of somatization, OCD, anxiety, hostility, phobia, paranoid ideation, and appetite and sleep disorders.

DISCUSSION

The influence of midwifery education and listening to classical music on the experience of pain in childbirth

The analysis of the results of this study proved the connection between midwifery education and listening to classical music in pregnancy with the experience of pain in childbirth. Participants from the experimental group rated their childbirth pain as moderate, while participants from the control group experienced childbirth pain as severe pain. Even on a small sample (n=30) and with a short but intensive 2.5 - day education, Duncan et al. (2017) were able to confirm the impact of education on pain perception because the experimental group required fewer analgesics during childbirth and had better psychological functioning, but the authors stated that a larger sample was still needed for a more precise conclusion.

In a study from Iran on 195 pregnant women divided into two groups, midwives received pain on a VAS scale as severe pain, and those in a control group (received normal care without the education) rated the pain as slightly lower than the strongest. possible pain (Firouzbakht et al. 2015). There is a noticeable difference in the experience of pain between our and Iranian respondents. The influence of ethnicity on the experience of pain was found in a study of 225 Jewish and 192 Bedouin women. The VAS scale was used to assess pain in two measurements: after delivery and the day after childbirth. Significantly lower scores on postpartum pain were given by Bedouin women in the postpartum measurement compared to Jewish subjects, although postpartum

Table 4. Relationship between global stress measures and subjective pain assessments - tested with Pearson's correlation coefficient

	VAS	Global stress index	Total positive symptoms
Global stress index	0.214*		
Total positive symptoms	0.177*	0.947*	
Index of positive symptoms	0.178*	0.217*	-0.012

measurements had a small difference in pain scores (Sheiner et al. 1999). The personality of a midwife can also have an impact on the perception of pain in a woman giving birth. Midwives with more years of work experience and more births may show less empathy for a woman's pain, and value it less than midwives with less work experience (Williams et al. 2013). Also, the personality traits of the woman who gives birth have an impact on the experience of pain.

In a sample of 220 women in an Iranian study using the Big Five questionnaire, a positive association was found between a high assessment of pain and neuroticism and the aggressiveness of the respondents. Conscientiousness as a dimension of personality was negatively correlated with the experience of pain (Yadollahi et al. 2014). Listening to music during pregnancy and applying breathing techniques in the first postpartum phase to 75 first -borns in Turkey was an intervention (identical to the intervention of this study) that had an impact on lower perceptions of childbirth pain (Yildirim & Sahin 2004).

Listening to classical music (Mozart and Beethoven) during the application of therapy in newborns had a significant effect on pain (oxygen saturation and heart rate were measured) (Rossi et al. 2018). In the test during the study, our respondents stated that the vast majority listened to Mozart, while a small group combined different performers (Beethoven, Mozart, and Christian instrumental music). The implication for future studies is to form several groups, each of which will listen to different performers, and offer better evidence of the impact of each type of music on the level of pain. A meta - analysis (Lee 2016) covering 97 RCT studies from 1995 to 2014 also does not indicate which type of music has a significant impact on pain perception but only offers evidence of the impact of music on pain, suggesting the need for better methodologies in the future studies.

The influence of midwifery education and listening to classical music on the occurrence of psychological symptoms in the puerperium

The analysis of the results showed a significant difference in the incidence of psychological symptoms between the participants of the experimental and control groups through measurements performed 6 weeks after birth. A significant difference in the incidence of psychological symptoms between participants in the experimental and control groups was found in the dimensions of interpersonal sensitivity, hostility, phobic anxiety, and paranoid ideation. The mother's postnatal hostility can have a significant negative impact on a child's cognitive - emotional development according to evidence found in an Australian longitudinal prospective study conducted on 2,200 families (Giallo et al. 2014).

The average age of the participants in the total sample in our study was 31.1 years, which means that at the beginning of the war in Bosnia and Herzegovina they were about 4 years old. Studying the impact of the El Salvador civil war on its citizens, 26 years after the end of the war, social psychologist Ignacio Martin Baro brought increased hostility to a significant link to a traumatic experience rooted in exposure to collective violence (Blanco et al. 2016).

It is very likely that our participants during the war, who were extremely active in the Herceg-Bosna Canton where the study was conducted, were exposed to at least one traumatic experience such as refugees, absence of fathers due to active participation in the war, loss of family members, etc. partly affect increased hostility. The war in Bosnia and Herzegovina and the abandonment of homes have led to changes in family functioning, ie changes in family roles and responsibilities, views on family memories, changes in relationships with other family members, and family ties (Weine et al. 2004).

Significantly higher phobic anxiety was found among the control group compared to the experimental group. Fear of childbirth may be associated with the risk of developing anxiety (Handelzalts et al. 2015), which supports our study because it is expected that respondents who have been educated and listened to classical music have less fear of childbirth, and thus develop less anxiety. Phobic disorders can also be hereditary, that is, a hereditary tendency to have an anxious character within certain families is possible (Smoller et al. 2008).

Insufficient autonomy and ability to prove, and limitation during adolescence were negatively associated with the development of social anxiety in a study conducted among 471 Spanish adolescents (59.65% of female respondents were in the sample) (Navarro et al. 2008). A study by Lang et al. (2006) found a link between anxiety and maximal assessment of childbirth pain, and this link was stronger compared to all other psychosocial factors investigated. The question also arises as to whether and what kind of music the control group listened to during the study? Could possible exposure to popular, often too loud music of inappropriate frequencies, affect the poorer mental health measures of the control group?

The fact that there are no significantly increased symptoms of depression remains unclear, although depression is cited as the most common mental disorder after childbirth. In a 2013 study, Field et al. find that social support significantly affects cortisol levels in midwives, and also reduces postpartum depression. It is to be assumed, in line with the mentality in the study area, that respondents in both puerperium groups certainly had greater social support and contacts compared to Western culture where postpartum depression occurs as the most common puerperium disorder. In the total sample, there were 9 unmarried / divorced participants, whose mental health measures may have been worse due to the lack of partner support, which Belsky (1984) cites as the most important in the support system, but without statistical significance on the overall score. Pain assessment in our study was significantly positively associated with almost all dimensions of symptoms except interpersonal sensitivity, depression, and psychoticism. Mothers who rated their childbirth pain higher also had increased symptoms of somatization, OCD, anxiety, hostility, phobia, paranoia, and appetite, and sleep disorders. According to our finding, neither in a study conducted by Zhang Y. et al. (2018) in 565 Chinese participants, no significant association was found between the assessment of childbirth pain and the occurrence of depressive symptoms in the puerperium. The analysis of the results of this study did not find a significant difference in the severity of depressive symptoms between the test and control groups. Symptoms of interpersonal sensitivity were significantly higher in control group participants compared to the experimental group who underwent training and listened to classical music during pregnancy. While perinatal depressive symptoms are usually transient, interpersonal sensitivity is more stable.

Antenatal interpersonal sensitivity significantly predicted the unstable quality of the mother -child emotional relationship measured 12 months after birth in a study (2019) conducted by Rhaine et al. 2019). Gilanifar (2017) stated that interpersonal sensitivity is positively associated with alexithymia and that pregnant women with alexithymia in the puerperium are more likely to develop psychopathology than pregnant women who do not have this disorder. In addition to acquiring the necessary knowledge during education and listening to classical music in pregnancy, participants in the experimental group in this study had the opportunity to connect and share experiences, which could strengthen self-confidence and create a significant difference in symptoms of interpersonal sensitivity compared to the control group. A significant association was found between pain assessment and elevated somatization symptoms. A systematic review (Evagorou et al. 2016) that synthesized the conclusions of 106 articles found that there is a greater tendency to somatize postpartum depressive symptoms in non - Western cultures and areas burdened by migration. Significantly low correlations were also found between pain assessments and measures of global stress, as well as stress and positive symptom index. Exposure to stress during pregnancy increases the risk of developing complications in childbirth and affects the more frequent use of maternity leave (Jonsdottir et al. 2019). First - borns experience less stress than those women who have social support during pregnancy (Goletzke et al. 2017). Pregnancy and the arrival of a new family member are considered one of the major life stressors (Holmes & Rahe 1967). Stress levels and coping strategies are significant predictors in the later development of anxiety (Blalock & Joiner 2000, Radat et al. 2008). The analysis of the results did not reveal a significant difference in stress indices between the participants of the experimental and control groups. Significantly more participants in the experimental group estimated that there were no „no" psychological symptoms, and had significantly fewer responses „in moderation" compared to controls. Similar values were found by Bjelanović et al. in a study conducted in SKB Mostar (2012) on participants with regular and pathological pregnancies (n=162), where the expression of psychological symptoms in respondents with regular pregnancies was consistent with the findings of our participants in the control group during puerperium. The severity of psychological symptoms in participants in the experimental group of this study was lower, which is another evidence of the impact of education in pregnancy and listening to classical music on better mental health in the puerperium.Most of our participants listened to Mozart's compositions, which are associated with increased dopamine, reduced prolactin (Tasset et al. 2012), and better cognitive functions compared to Beethoven's compositions (Verrusio et al. 2015). So far, there are not many studies on the effects of music on human behavior, but in animals, music lowers cortisol levels and increases oxytocin significantly in interrelationship (Harvey 2020). The methodological shortcoming of this study is the inability to conclude which of the two interventions has a significant impact on outcome measures, as well as which type of music is more effective. Interventions carried out together certainly have a positive effect, but future research needs to prove which provides greater benefits in antenatal care: music therapy (what kind of music) or education?

CONCLUSION

This study proved the impact of midwifery education and listening to classical music on the perception of pain in childbirth, and mental health in the puerperium. Participants in the experimental group rated their labor pain as moderate pain, while participants in the control group experienced severe labor pain. A significant difference in the incidence of psychological symptoms was also found between participants in the experimental and control groups 6 weeks after delivery. The experimental group had fewer psychological symptoms in the

dimensions of interpersonal sensitivity, hostility, phobic anxiety, and paranoid ideation. This study is one in a series of proofs that quality midwifery care using a simple, non-pharmacological method such as music therapy has a significant impact on outcomes in childbirth and puerperium. Evidence - based education can shape women's attitudes and strengthen their self - confidence, thus contributing to a positive experience of childbirth and motherhood as well as mental health status, which is an invaluable benefit to the individual, family, health system, and society as a whole.

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Contribution of individual authors:

Roberta Perković: participated in the development of the design, methodology and draft of the study, conducted training, data entry, participated in data interpretation and data analysis.

Koštana Dević: participated in the distribution of questionnaires, preparation of data for entry, IT support.

Antonija Hrkać: participated in the verification of data entry, statistical processing and interpretation of dana.

Nikolina Šaravanja: conducted statistical processing and interpretation of data, technical support.

Vajdana Tomić & Branko Krišto: participated in the development of design and methodology, critical revision of the study.

Helena Dukić & Vida Vacilj: participated in the critical revision of the study.

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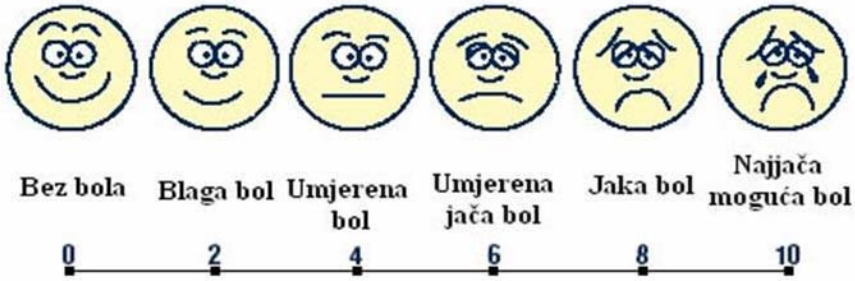
Appendix 1. Visual Analog Scale



VAS is 10 units long, from 0 to 10, on which between the mark 0 - no pain - and 10 - the most severe possible pain - you can show what your pain is. Pain is a subjective and personal feeling of each of us, so I would beg you to assess and record your pain intensity on the scale below.

Appendix 2. Self - Assessment Scale - SCL-90 (Icp / Nimh / Blips)
To what extent have you suffered or are suffering from the following:

1.	Headache	Not at all	Little	Moderately	A lot	Extremelylot
2.	Nervousness or anxiety	Not at all	Little	Moderately	A lot	Extremelylot
3.	Inability to drive away unwanted thoughts or words	Not at all	Little	Moderately	A lot	Extremelylot
4.	Feeling unconscious or dizzy	Not at all	Little	Moderately	A lot	Extremelylot
5.	Loss of occupation or sexual pleasure	Not at all	Little	Moderately	A lot	Extremelylot
6.	Desire to criticize others	Not at all	Little	Moderately	A lot	Extremelylot
7.	The belief that others can control your thoughts	Not at all	Little	Moderately	A lot	Extremelylot
8.	Beliefs that others are to blame for your distractions	Not at all	Little	Moderately	A lot	Extremelylot
9.	Forgetfulness	Not at all	Little	Moderately	A lot	Extremelylot
10.	Concern for one's negligence	Not at all	Little	Moderately	A lot	Extremelylot
11.	Someone easily makes you angry or upset	Not at all	Little	Moderately	A lot	Extremelylot
12.	Pain in the heart or chest	Not at all	Little	Moderately	A lot	Extremelylot
13.	Fear of open spaces or streets	Not at all	Little	Moderately	A lot	Extremelylot
14.	You feel weak and emaciated	Not at all	Little	Moderately	A lot	Extremelylot
15.	Suicidal ideas	Not at all	Little	Moderately	A lot	Extremelylot
16.	You hear voices that other people don't hear	Not at all	Little	Moderately	A lot	Extremelylot
17.	Trembling	Not at all	Little	Moderately	A lot	Extremely lot
18.	You don't trust others	Not at all	Little	Moderately	A lot	Extremelylot
19.	Lack of appetite	Not at all	Little	Moderately	A lot	Extremely lot
20.	Frequent crises and crying	Not at all	Little	Moderately	A lot	Extremelylot
21.	You are uncomfortable in contact with the opposite seks	Not at all	Little	Moderately	A lot	Extremelylot
22.	You feel trapped	Not at all	Little	Moderately	A lot	Extremelylot
23.	Sudden fears for no reason	Not at all	Little	Moderately	A lot	Extremelylot
24.	Uncontrolled outbursts of anger	Not at all	Little	Moderately	A lot	Extremelylot
25.	You are afraid to go out alone	Not at all	Little	Moderately	A lot	Extremelylot
26.	You blame yourself for a lot	Not at all	Little	Moderately	A lot	Extremelylot
27.	Back pain	Not at all	Little	Moderately	A lot	Extremelylot
28.	You are not capable of bringing anything to an end	Not at all	Little	Moderately	A lot	Extremelylot
29.	You feel lonely	Not at all	Little	Moderately	A lot	Extremelylot
30.	Your self-esteem is low	Not at all	Little	Moderately	A lot	Extremelylot
31.	You worry too much about everything	Not at all	Little	Moderately	A lot	Extremelylot
32.	You lose interest in everything	Not at all	Little	Moderately	A lot	Extremelylot
33.	Expressed feeling of fear	Not at all	Little	Moderately	A lot	Extremelylot
34.	It is easy for someone to hurt or offend you	Not at all	Little	Moderately	A lot	Extremelylot
35.	You are convinced that others know what you think	Not at all	Little	Moderately	A lot	Extremelylot
36.	You have a feeling that you do not find understanding	Not at all	Little	Moderately	A lot	Extremelylot
37.	You feel that others are not your friends and that you dislike them	Not at all	Little	Moderately	A lot	Extremelylot
38.	Do everything slowly to make sure you are doing the right thing	Not at all	Little	Moderately	A lot	Extremelylot
39.	Strong heartbeat	Not at all	Little	Moderately	A lot	Extremelylot
40.	You have dizziness and stomach pain	Not at all	Little	Moderately	A lot	Extremelylot

Note: In the list that follows, the disorders and problems that we often encounter in humans are listed. Read it carefully and try to remember if, of some of the above, you have suffered during the past week (including today), and if so, with what intensity. Answer all the questions by circling the intensity of each disturbance. In case of a mistake or change of opinion, correct it clearly and understandably.

Appendix 2. Self - Assessment Scale - SCL-90 (Icp / Nimh / Blips)

41.	You have a sense of inferiority	Not at all	Little	Moderately	A lot	Extremelylot
42.	Your muscles hurt	Not at all	Little	Moderately	A lot	Extremelylot
43.	You have the feeling that others are watching you and talking about you	Not at all	Little	Moderately	A lot	Extremelylot
44.	It's hard to fall asleep	Not at all	Little	Moderately	A lot	Extremelylot
45.	You have to control the procedures	Not at all	Little	Moderately	A lot	Extremelylot
46.	Difficult decision making	Not at all	Little	Moderately	A lot	Extremelylot
47.	Fear of riding a bus, tram, subway, or train	Not at all	Little	Moderately	A lot	Extremelylot
48.	You lose your breath	Not at all	Little	Moderately	A lot	Extremelylot
49.	You are very hot or shivering from the cold	Not at all	Little	Moderately	A lot	Extremelylot
50.	You need to avoid some objects, places, or activities because they scare you	Not at all	Little	Moderately	A lot	Extremelylot
51.	A feeling of emptiness in the head	Not at all	Little	Moderately	A lot	Extremelylot
52.	Numbness of some parts of the body	Not at all	Little	Moderately	A lot	Extremelylot
53.	Dumplings in the throat	Not at all	Little	Moderately	A lot	Extremelylot
54.	You look hopelessly to the future	Not at all	Little	Moderately	A lot	Extremelylot
55.	You can't concentrate	Not at all	Little	Moderately	A lot	Extremelylot
56.	A feeling of weakness in some parts of the body	Not at all	Little	Moderately	A lot	Extremelylot
57.	You are tense	Not at all	Little	Moderately	A lot	Extremelylot
58.	Feeling of heaviness in the arms or legs	Not at all	Little	Moderately	A lot	Extremelylot
59.	Thinking about death	Not at all	Little	Moderately	A lot	Extremelylot
60.	You eat too much	Not at all	Little	Moderately	A lot	Extremelylot
61.	It bothers you when someone looks at you or talks about you	Not at all	Little	Moderately	A lot	Extremelylot
62.	You are tormented by thoughts that are not peculiar to you	Not at all	Little	Moderately	A lot	Extremelylot
63.	You feel the urge to hurt or harm someone	Not at all	Little	Moderately	A lot	Extremelylot
64.	You wake up early in the morning and can't sleep anymore	Not at all	Little	Moderately	A lot	Extremelylot
65.	You feel the need to repeat some actions, touch something, count, wash your hands, etc.	Not at all	Little	Moderately	A lot	Extremelylot
66.	Restless and interrupted sleep	Not at all	Little	Moderately	A lot	Extremelylot
67.	You feel the urge to break something	Not at all	Little	Moderately	A lot	Extremelylot
68.	Cultivate beliefs that are foreign to other people	Not at all	Little	Moderately	A lot	Extremelylot
69.	You are very uncomfortable in the company	Not at all	Little	Moderately	A lot	Extremelylot
70.	You are not comfortable in crowds, shops or the cinema	Not at all	Little	Moderately	A lot	Extremelylot
71.	The feeling that everything takes effort	Not at all	Little	Moderately	A lot	Extremelylot
72.	Moments of horror or panic	Not at all	Little	Moderately	A lot	Extremelylot
73.	You are uncomfortable when you eat or drink in front of others	Not at all	Little	Moderately	A lot	Extremelylot
74.	You often get into fights	Not at all	Little	Moderately	A lot	Extremelylot
75.	You are not comfortable when you are alone	Not at all	Little	Moderately	A lot	Extremelylot
76.	You feel that others do not appreciate your work	Not at all	Little	Moderately	A lot	Extremelylot
77.	You are sad and lonely and in company	Not at all	Little	Moderately	A lot	Extremelylot
78.	You are very nervous, you can't sit still	Not at all	Little	Moderately	A lot	Extremelylot
79.	You feel useless	Not at all	Little	Moderately	A lot	Extremelylot
80.	You have a feeling that generally known things are weird and unreal	Not at all	Little	Moderately	A lot	Extremelylot
81.	You shout and throw objects	Not at all	Little	Moderately	A lot	Extremelylot
82.	You are afraid that you will faint in front of others	Not at all	Little	Moderately	A lot	Extremelylot
83.	You think others might benefit from you	Not at all	Little	Moderately	A lot	Extremelylot
84.	Thoughts about sex that make you sad	Not at all	Little	Moderately	A lot	Extremelylot
85.	You feel you have to suffer for sin	Not at all	Little	Moderately	A lot	Extremelylot
86.	A sense of compulsion to complete the actions begun	Not at all	Little	Moderately	A lot	Extremelylot
87.	You think you have a serious illness	Not at all	Little	Moderately	A lot	Extremelylot
88.	You don’t feel close to others	Not at all	Little	Moderately	A lot	Extremelylot
89.	You feel guilty	Not at all	Little	Moderately	A lot	Extremelylot
90.	You feel something is wrong in your head	Not at all	Little	Moderately	A lot	Extremelylot

Note: In the list that follows, the disorders and problems that we often encounter in humans are listed. Read it carefully and try to remember if, of some of the above, you have suffered during the past week (including today), and if so, with what intensity. Answer all the questions by circling the intensity of each disturbance. In case of a mistake or change of opinion, correct it clearly and understandably.

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