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Effectiveness of Video-Based Education on Parental Practices to Protect Newborns from Noise: A Pre-test/Post-test Study

Video Tabanlı Eğitimin, Yenidoğanları Gürültüden Korumaya Yönelik Ebeveyn Uygulamaları Üzerindeki Etkililiği: Ön Test/Son Test Çalışması

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ABSTRACT

Objective: This study aimed to evaluate the impact of a video-based training intervention on parents' knowledge and practices regarding the protection of newborns from noise exposure.
Methods: This study was conducted using a one-group pre-test/post-test design. The sample consisted of 65 parents. Data were collected through a demographic information form, a knowledge and practice form related to protecting newborns from noise, and an educational video developed by experts, with a content validity index (CVI) calculated as 0.99.
Results: Post-intervention knowledge and practice scores were significantly higher than pre-test scores ($p<0.05$). The most notable improvements were observed in recognising the health risks of noise, appropriate room placement, awareness of acceptable decibel levels, and practical actions like placing felt pads under furniture. Participants who received training from midwives had significantly higher knowledge scores.
Conclusion: Video-based education significantly improved parents' awareness and practical behaviours in protecting newborns from environmental noise. This method can serve as an effective tool in newborn care education, particularly when delivered by midwives.

Keywords:

Newborn; Noise exposure; Parental education; Video-based training.

ÖZ

Amaç: Bu çalışma, video tabanlı bir eğitim müdahalesinin ebeveynlerin yenidoğanları gürültüden korumaya yönelik bilgi ve uygulamalarına etkisini değerlendirmeyi amaçlamıştır.
Yöntem: Araştırma, tek gruplu öntest-sontest tasarımı kullanılarak yürütülmüştür. Örneklem 65 ebeveynden oluşmuştur. Veriler; demografik bilgi formu, yenidoğanları gürültüden korumaya yönelik bilgi ve uygulama formu ve uzmanlar tarafından geliştirilen, kapsam geçerlilik indeksi (CVI) 0.99 olarak hesaplanan eğitim videosu aracılığıyla toplanmıştır.
Bulgular: Müdahale sonrası bilgi ve uygulama puanları, öntest puanlarına göre anlamlı düzeyde daha yüksek bulunmuştur ($p<0.05$). En belirgin gelişmeler; gürültünün sağlık risklerini fark etme, uygun oda yerleşimi, kabul edilebilir desibel düzeylerine ilişkin farkındalık ve mobilya ayaklarının altına keçe yerleştirme gibi pratik önlemler alanlarında gözlenmiştir. Ebelerden eğitim alan katılımcıların bilgi puanları anlamlı olarak daha yüksek bulunmuştur.
Sonuç: Video tabanlı eğitim, ebeveynlerin çevresel gürültüye karşı yenidoğanları korumaya yönelik farkındalık ve pratik davranışlarını anlamlı şekilde geliştirmiştir. Bu yöntem, özellikle ebeler tarafından uygulandığında, yenidoğan bakım eğitiminde etkili bir araç olarak kullanılabilir.

Anahtar Sözcükler:

Yenidoğan; Gürültü maruziyeti; Ebeveyn eğitimi; Video tabanlı eğitim.

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INTRODUCTION

Newborns face environmental and biological risks before and after birth. One of these is stimuli such as light, odour, and especially noise. Noise is defined as irregular sounds, while sound refers to vibrations perceived by the ear (TDK,2025). The foetal hearing system develops at 18 weeks of gestation and matures around 28 weeks, when the foetus reacts to maternal sounds. Intrauterine sound levels are about 50 dB (Çalıkuşu İncekar & Balcı, 2017). After birth, high noise may cause sleep problems, physiological changes, behavioural disorders, and neurological damage (Gomella, 2012; Hockenberry & Wilson, 2011). Therefore, it is recommended that sound levels remain under 50–55 dB, sudden increases be avoided, and protective measures such as incubator covers be applied, particularly in intensive care (Gomella, 2012; Hockenberry & Wilson, 2011).

Noise-reducing methods include neonatal oxygen hoods (Çalıkuşu İncekar, M., Çeçen, E., Balcı, S., Mutlu, Ulu Öğüt, & Hamilçıkan, 2019), sound-absorbing incubator covers (Karadağ, 2016), and headphones (Khalesi et al. 2017). Environmental modifications and behavioural changes are also effective (Ramesh et al. 2009). A study in Turkiye showed that awareness training for healthcare staff and parents increased knowledge and reduced noise in units and incubators (Bayar Şaşkın, & Altundağ, 2020). However, literature notes that such training is insufficient and should be repeated regularly. In this context, video-based education with audio-visual content may enhance awareness and provide lasting learning for parents to protect newborns from noise both at home and outdoors.

Methods

Research Desing

This research was conducted with the same group in a quasi-experimental design as a pretest-posttest.

Population Sample

The population of the study consisted of all parents with newborn babies in Turkey. Since the population was large, a non-probability convenience sampling method was used. The data collection process was carried out online with parents who voluntarily agreed to participate and could access the Google Forms link.

Inclusion criteria were:

- Being the parent of a healthy term newborn (0–28 days)**,**
- Being 18 years of age or older,
- Being able to read and understand Turkish,
- Completing all sections of the online form,
- Providing informed consent.

Exclusion criteria were:

- Having a preterm or low-birth-weight infant,
- Having a newborn hospitalized in the neonatal intensive care unit,
- Having an infant with hearing problems, congenital anomalies, or special care needs,
- Submitting an incomplete form.

Parents who met these criteria were included in the study. The sample size was calculated using G*Power (v3.0) with an effect size of 0.5, an alpha of 0.05, and a study power of 0.99. When the required sample size was reached, the form was closed and data collection was terminated. A total of 65 parents were included in the sample.

Data Collection

The research data were collected with Google Forms in order to protect the environment and prevent paper waste. The form link was shared via social media and WhatsApp, and the participants were informed about the research. First, the informed consent form, then the introductory information form, and then the information and application form were filled out. Parents who filled out all these forms clicked on the video link, and when the video was watched, the post-test was opened, and the research was completed when the parents completed the post-test. When a sufficient sample size was reached, the form was closed, and the data collection process was terminated.

The primary aim of our study was to examine the change in parents' knowledge levels. Accordingly, the post-test measurement was administered immediately after the video-based training. Due to the nature of the study design, it was not possible to observe actual practice behaviors over the long term, which constitutes a natural limitation of the research.

Therefore, the "practice" variable was evaluated not through the direct observation of behavior, but through changes in parents' awareness, intentions, and tendencies toward practice following the training. Since education aims to enhance not only the cognitive and affective aspects of learning but also future-oriented intention and awareness in the behavioral domain, the findings related to practice reflect parents' readiness to change their practices in the future.

Data Collection Tools

Introductory Information Form: This form, which was prepared by the researchers and consists of 13 questions in total, includes questions such as age, education, income level, and noise education level of the parents.

Protecting Newborns from Noise: Information and Application Form: The form consists of 11 items, including information and practices such as the decibel range in which newborns should not be exposed to noise, how to protect them from noise, and the damage of noise to the newborn. Before the form was applied, expert opinion was obtained from 5 experts who are experts in midwifery and child health, and disease nursing. Expert opinions were evaluated, and the Content Validity Index (CVI) was calculated as 0.99.

Video-Based Noise Protection of Newborns: Knowledge and Practice Training: The training was explained in line with the literature. After the video was prepared, expert opinion was obtained from 5 experts who were experts in midwifery and child health, and disease nursing. Expert opinions were evaluated, and the Content Validity Index (CVI) was calculated as 0.99. The training, which includes sounds and how many decibels are shown visually and audibly, consists of a 10-minute video on how to protect newborns from noise.

Data Analysis

The data were analysed with IBM SPSS v.25 software. Descriptive statistics (frequency, percentage, mean, SD) were used to determine demographic structure and trends. In order to determine the effect of video training, a pre-test and post-test were applied to the participants. The distribution of the data was tested with the Kolmogorov-Smirnov test. The Wilcoxon signed-rank test was applied for non-normally distributed data. Significance level was accepted as $p < 0.05$ in all analyses.

Ethical Consideration

Ethics committee approval was obtained from the Üsküdar University Non-Interventional Research Ethics Committee (Date: 28.02.2025 No: 67). The principles of the Declaration of Helsinki were followed.

Results

Table 1 shows that 20% of the 65 parents of newborns who participated in the study were 18-24 years old, 32.3% were 25-29 years old, 27.7% were 30-34 years old, and 20% were 35-39 years old. 13.8% of the participants had primary education, 24.6% had high school education, 21.5% had an associate's degree, and 40% had a bachelor's degree. 12.3% of the participants have been living in the village for a long time, 29.2% in the district centre, 36.9% in the provincial centre, and 21.5% in the metropolitan area. The income of 15.4% of the participants is less than their expenses, 66.2% of the participants' income is equal to their expenses, and 18.5% of the participants' income is higher than their expenses. 92.3% of the participants define their learning type as visual, 7.7% as auditory. The social security of 80% of the participants was SSI, while 20% had private health insurance.

Table 2 shows the distribution of the participants according to their neonatal education status. Forty percent of the participants had received neonatal and noise training before. Of the participants who received neonatal and noise education (n=26), 30.8% received neonatal and noise education at the pregnancy school, 19.2% at the time of discharge, 19.2% at family medicine, and 30.8% at other places. Of the participants who received newborn and noise education (n=26), 20% received education from nurses, 48% from midwives, 16% from physicians, 16% from social media experts, and 6.3% from relatives.

Among the participants who received neonatal and noise education (n=26), 34.6% considered the neonatal and noise education adequate, and 65.4% considered it partially adequate. 83.1% of the participants would like to

receive/receive neonatal and noise training. 60% of the participants think that the best time for neonatal and noise education is before discharge, 7.7% during discharge, and 32.3% at any time with occasional reminders. 24.6% of the participants did not think of any method to protect the newborn from noise, 47.7% thought of reducing the sound of TV, etc., 7.7% thought of wearing headphones, 20% thought of reducing the ringtone / warning others about this issue.

Table 1. Distribution of participants according to demographic characteristics

Demographic Variable	Groups	n	%
Age	18-24 age	13	20.0
	25-29 age	21	32.3
	30-34 age	18	27.7
	35-39 age	13	20.0
Education status	Primary education	9	13.8
	High School	16	24.6
	Associate degree	14	21.5
	Licence	26	40.0
Where has lived for a long time	Village	8	12.3
	District center	19	29.2
	Provience center	24	36.9
	Metropolitan	14	21.5
Income status	Income less than expenditure	10	15.4
	Income equal to expenditure	43	66.2
	Income higher than expenditure	12	18.5
Learnin type	Visual	60	92.3
	Auditory	5	7.7
Social security	SSI	52	80.0

p<0.05 SSI: Social Security Institution

Table 2. Distribution of participants according to educational status

Education status	Groups	n	%
Receipt of neonatal and noise education	Yes	26	40.0
	No	39	60.0
Place of education	Pregnancy school	8	30.8
	During discharge	5	19.2
	Family medicine	5	19.2
	Other	8	30.8
From whom received the training	From the nurse	5	20.0
	Midwife	12	48.0
	Doctor	4	16.0
	From experts on social media	4	16.0
Perception of education as adequate	Yes	9	34.6
	No	17	65.4
Willingness to receive/receive newborn and noise training	Yes	54	83.1
	No	11	16.9
Optimal time for newborn and noise training	Before discharge	39	60.0
	During Dixcharge	5	7.7
	Always with occasional reminders	21	32.3
The method is considering to protect newborns from noise	No	16	24.6
	Turning down the sound ont TV etc.	31	47.7
	Wearing a headset	5	7.7
	Mute the ringer volume/warm to mute	13	20.0

p<0.05

In Table 3, it was determined that there was a significant difference (Z=-3,26; p<0,05) between the pre-test and post-test total scores of the Parent Information Form for Noise Protection of Newborns. The knowledge total score after the Video Viewing for Noise Protection of Newborns is significantly higher than the pre-test score. Accordingly, showing "video on protecting newborns from noise" to the parents of newborns contributed significantly to the knowledge on protecting newborns from noise.

Table 3. Comparison of pre-test and post-test item scores of the Parental Information Form for Noise Protection of Newborn

	Pre- Test – Post- Test Difference				
Article	**$\bar{X}$**	**SS**	**SH**	**Z**	**p**
1. I think attention should be paid to noise in environments where newborns are present.	-0.14	1.06	0.13	-1.36	0.175
2. Potential health problems in newborns due to loud noise: hearing problems, stress, and sleep disturbances	-0.31	1.04	0.13	-2.65	**0.008**
3. The sleeping environment of newborns should be kept quiet.	-0.17	1.35	0.17	-0.92	0.357
4. Parents should be provided with more information about the importance of hearing protection and noise in newborns.	-0.11	1,63	0.20	-0.89	0.374
5. To protect newborns from noise, their rooms should be located in the quietest and most sound-insulated part of the house.	-0.58	1.14	0.14	-3.65	**0.000**
6. Environmental sounds should be maintained at a certain level for newborns.	-0.22	1.10	0.14	-1.57	0.116
7. Noise levels for newborns should not exceed 45 dB, and should not rise above 70 dB.	-0.42	1.01	0.13	-3.13	**0.002**
8. To protect newborns from noise, felt pads should be placed under the legs of chairs, tables, and similar furniture.	-0.65	1.60	0.20	-2.94	**0.003**
9. Drawers and cabinet doors should be soft-closing or fitted with pads to minimize noise.	-0.23	1.23	0.15	-1.63	0.102
10. A quiet area should be used when putting newborns to sleep.	0.20	1.13	0.14	-1.41	0.160
11. Noise causes newborns to feel stressed, cry more, and waste energy.	-0.38	1.13	0.14	-2.57	**0.010**
12. Noise adversely affects the sleep patterns of newborns.	-0.03	1.03	0.13	-0.39	0.699
13. In noisy environments (e.g., concerts, matches, weddings), newborns should use noise-protection headphones.	-0.29	1.40	0,17	-1.70	0.089
14. To protect newborns from noise, doorbells should be turned down and noise from slippers, shoes, TVs, etc. minimized.	-0.20	0.85	0.11	-1.84	0.065
TOTAL	-3.31	7.36	0.91	-3.26	**0.001**

p<0,05 $\bar{X}$: Mean, SD: Standard deviation, SE: Standard error, Z: test statistic.

When analysed at the item level, "1. I think that attention should be paid to noise in the environment where newborns are present.", "3. It should be ensured that the environment where newborns sleep is quiet", "4. Parents should be provided with more information about protecting the hearing health of newborns and the importance of noise", "6. Environmental sounds should be kept at a certain level for newborns", "9. In order to protect the newborn from noise, soft-closing drawer and cupboard doors should be preferred or felts that will not make noise when closed should be placed", "10. In order to protect newborns from noise, it is necessary to use special headphones to protect newborns from noise in noisy environments (matches, concerts, weddings, etc.)", "14. In order to protect newborns from noise, the doorbell level should be reduced and stimuli such as slippers, shoes, TVs that make noise in the house should be minimised" There was no significant difference (p>0.05) between the pre-test and post-test scores. "2. Newborns may experience health problems (hearing, stress, sleep problems, etc.) due to loud noises." (Z=-2,65; p<0,05), "5. In order to protect newborns from noise, their rooms should be in the quietest and noiseless part of the

house" (Z=-3,65; p<0,05), "7. The noise intensity unit for newborns should be 45 decibels at the highest and this rate should be increased to a maximum of 70 decibels" (Z=-3,13; p<0,05), "8.Felt should be placed under the feet of items such as chairs, tables and coffee tables to protect newborns from noise" (Z=-2,94; p<0,05), "11. Noise causes newborns to experience stress, cry and indirectly waste their energy" (Z=-2,57; p<0,05).

After watching the video on protecting newborns from noise, it was found that "2. Health problems (hearing, stress, sleep problems, etc.) may occur in newborns due to loud noises.", "5. In order to protect newborns from noise, their rooms should be in the quietest and noiseless part of the house.", "7. The noise intensity unit for newborns should be 45 decibels at the highest, and this rate can increase to 70 decibels at the most.", "8. Felt should be placed under the feet of items such as chairs, tables, and coffee tables to protect the newborn from noise. "11. Noise causes newborns to experience stress, cry, and indirectly waste their energy".

In Table 4, it was determined that there was a significant difference (Z=-3,15; p<0,05) between the pre-test and post-test total scores of the Parent Application Form for Protecting Newborns from Noise. The total score of the information application after the Video Viewing for Protecting Newborns from Noise is significantly higher than the pre-test score. According to this, showing "video for protecting newborns from noise" to parents with newborns contributed significantly to the practices for protecting newborns from noise.

Table 4. Comparison of pro-test and post-tst item cores of the Parent Application Form for Protecting Newborns from Noise

	Pre- Test – Post- Test Difference				
Article	**$\bar{X}$**	**SS**	**SH**	**Z**	**p**
1. Paying attention to noise levels in environments where newborns are present	0.09	0.55	0.07	-1.34	0.180
2. Ensuring that the environment where the newborn sleeps is quiet	-0.09	1.33	0.17	-0.16	0.871
3. Ensuring that the newborn's room is located in the quietest and least noisy part of the house	-0.28	0.60	0.07	-3.40	**0.001**
4. Ensuring that noise levels for newborns do not exceed 45 decibels and do not rise above 70 decibels	-0.18	0.61	0.08	-2.35	**0.019**
5. Placing felt pads under the legs of furniture such as chairs, tables, and coffee tables to protect the newborn from noise	-0.43	0.77	0.10	-3.94	**0.000**
6. Preferring soft-closing drawers and cabinet doors, or placing felt pads to prevent noise when they are closed	0.03	0.88	0.11	-0.42	0.671
7. Moving the newborn to a quiet area during sleep time	0.20	0.75	0.09	-2.13	**0.033**
8. Using special noise-protection headphones for newborns in noisy environments (e.g., concerts, matches, weddings, etc.)	-0.72	1.56	0.19	-3.38	**0.001**
9. Lowering the volume of doorbells and minimizing indoor noise sources such as slippers, shoes, and televisions to protect the newborn from noise	-0.13	0.63	0.08	-1.58	0.115
TOTAL	-1.49	3.42	0.42	-3.15	**0.002**

p<0,05, $\bar{X}$: Mean, SD: Standard deviation, SE: Standard error, Z: test statistic.

When analysed at the item level, "1. Paying attention to noise in the environment where newborns are present", "2. Ensuring that the environment where newborns sleep is quiet", "6. Preferring soft-closing drawer and cabinet doors to protect newborns from noise / placing felts that will not make noise when closed", "9. To protect the newborn from noise, lowering the doorbell level, minimising stimuli such as slippers, shoes, TVs that make noise in the house" pre-test and post-test scores were not significantly different (p>0.05).

"3. Ensuring that the rooms of newborns are in the quietest and noise-free part of the house to protect them from noise" (Z=-3,40; p<0,05), "4. Ensuring that the noise intensity unit for newborns is 45 decibels at the highest and that this ratio does not exceed 70 decibels" (Z=-2,35; p<0,05), "5.Putting felt under the feet of items such as chairs, tables, coffee tables to protect the newborn from noise" (Z=-3,94; p<0,05), "7.

Moving newborns to a quiet area while they are put to sleep" (Z=-2,13; p<0,05), "8. Using special headphones to protect newborns from noise in noisy environments (matches, concerts, weddings, etc.)" (Z=-3,38; p<0,05) pre-test and post-test scores were found to be significantly different. After watching the video on protecting newborns from noise, "3. Ensuring that the rooms of newborns are in the quietest and noiseless part of the house to protect them from noise", "4. Ensuring that the noise intensity unit for newborns is 45 decibels at the highest and that this ratio does not exceed 70 decibels", "5. Putting felt under the feet of items such as chairs, tables, coffee tables to protect newborns from noise", "7. Moving newborns to a quiet area while they are being put to sleep", "8. Using special headphones to protect newborns from noise in noisy environments (matches, concerts, weddings, etc.)" application scores are significantly higher than the scores before watching the video.

DISCUSSION

This study evaluated the effect of video-based training on parents' knowledge and awareness regarding protecting newborns from noise. A significant improvement was found between pre-test and post-test scores of the Parent Application Form (Z=-3.15; p<0.05). Parents' post-test scores were higher, indicating that video training effectively increased their awareness and practices about newborn noise protection.

The literature shows that most parents of NICU-hospitalized infants and many health professionals have not previously received education on noise, remain unaware of its effects, and often ignore it. Training interventions for both groups have been shown to improve knowledge and reduce noise levels in neonatal units. In our study, 60% of parents reported no prior training on newborns and noise, consistent with previous findings. After video education, parents' knowledge improved significantly (Z=-3.26; p<0.05), supporting the importance of structured training.

Restin et al. (2021) demonstrated that NICU noise levels exceeded APA (45 dB) and WHO (35 dB) recommendations during daytime. Similarly, our study revealed parents' limited knowledge regarding recommended noise intensity. However, post-test results showed significant improvements in their understanding of acceptable noise levels. These findings emphasize the role of education in addressing persistent high noise exposure in NICUs.

In addition, higher post-test scores were recorded for items related to noise risks, such as potential health problems (hearing loss, stress, sleep disturbance), ensuring newborn rooms are quiet, and applying protective measures (e.g., felt under furniture, use of earmuffs in noisy environments). These results suggest that parents are more likely to adopt preventive practices once they understand the potential risks for their infants.

Comparable to the study by Çalıkuşu İncekar and Gözen (2021), our findings confirm that training significantly changes knowledge and attitudes toward noise. While improvements were observed in several knowledge and practice areas, some behaviors, such as placing felt under furniture, showed no significant difference, highlighting the gap between knowledge and practical implementation.

Overall, this study demonstrates that video-based education is an effective method to enhance parents' knowledge and awareness about protecting newborns from noise. However, continuous reinforcement and practical guidance may be necessary to transform knowledge into consistent practice.

CONCLUSION

Statistically significant increases were observed in both knowledge and practice scores after the video screening (p<0.05). The most significant increase in knowledge was created with the items about how loud noises may cause health problems, quiet positioning of rooms, limiting noise intensity, and furniture felt applications. At the application level, significant improvements were recorded, especially with behaviours such as choosing quiet areas, placing felt on furniture, and using special headphones.

The participants' level of education, demographic characteristics, or place of education did not affect the level of knowledge and practice in most variables; only the knowledge scores of those who received education from midwives were found to be significantly higher.

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The participants' level of education, demographic characteristics, or place of education did not affect the level of knowledge and practice in most variables; only the knowledge scores of those who received education from midwives were found to be significantly higher. These findings suggest that video-based education should be widely adopted in parental training on newborn noise protection, with midwives playing an active and central role in this process. In addition, sensitivity to noise should be systematically included in prenatal and discharge education programmes through visually supported approaches. The results also highlight the need to strengthen recommendations on newborn noise protection in national prenatal care guidelines. However, the study used a one-group pre-test/post-test design without a control group, which may limit the ability to attribute the observed changes solely to the intervention. Moreover, convenience sampling and self-reported data may have affected generalisability and introduced bias, and long-term retention of knowledge was not assessed.

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