International Journal of Innovative Research in Health Science

Published: November 2026

Volume 2, Issue 11, Pages 1-7



Research Article

DOI: https://doi.org/10.63349/ijirhs.202667

Effectiveness of guided imagery on blood pressure and stress among antenatal mothers with pregnancy-induced hypertension: a true experimental study in Puducherry

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Abstract:

Background: Pregnancy-induced hypertension (PIH) is associated with maternal and perinatal risks and may coexist with substantial psychological stress. Guided imagery is a non-invasive relaxation approach that may support emotional well-being and blood pressure management when used alongside standard obstetric care. This study evaluated the effectiveness of guided imagery on blood pressure and stress among antenatal mothers with PIH at Rajiv Gandhi Government Women and Children Hospital (RGGWCH), Puducherry. **Methods:** A quantitative true-experimental pre-test and post-test control-group design was used. Seventy antenatal mothers with PIH were selected and allocated to an experimental group (n=35) and a control group (n=35) using the lottery method. Blood pressure was measured with a calibrated sphygmomanometer, and stress was assessed using the 35-item Pregnancy Stress Rating Scale (PSRS). The experimental group received Tamil audio-guided imagery in addition to routine antenatal care; the control group received routine care. Assessments were conducted at baseline, day 7 and day 15. Data were analysed using descriptive statistics, chi-square tests, paired and unpaired t-tests, repeated-measures ANOVA and Pearson correlation. **Results:** In the experimental group, mean systolic blood pressure decreased from 152.80±6.08 mmHg at baseline to 132.23±5.71 mmHg on day 15 (reported repeated-measures F=68.96, p=0.0001). Mean diastolic pressure decreased from 90.66±5.71 to 81.66±6.66 mmHg (F=56.72, p=0.0001). Mean stress score decreased from 77.89±11.99 to 56.03±10.80 (F=74.77, p=0.0001). The control group showed no statistically significant within-group changes in these outcomes. Day-15 stress correlated positively with systolic pressure (r=0.421, p=0.012) and diastolic pressure (r=0.449, p=0.007) in the experimental group. **Conclusion:** The reported findings suggest that guided imagery may be a useful complementary nursing intervention for reducing blood pressure and stress among antenatal mothers with PIH. It should be used only as an adjunct to, and never a replacement for, evidence-based obstetric assessment and treatment.

Keywords: guided imagery; pregnancy-induced hypertension; blood pressure; stress; antenatal mothers; nursing intervention.

INTRODUCTION

Hypertensive disorders of pregnancy are important contributors to maternal and perinatal morbidity. Pregnancy-induced hypertension requires timely identification, close monitoring and appropriate obstetric management. Alongside the physiological burden of a high-risk pregnancy, affected women may experience uncertainty, anxiety and stress. Psychological distress can impair coping and may accompany adverse physiological responses.

Guided imagery is a mind–body relaxation technique in which a person is guided to imagine peaceful and reassuring scenes. Audio-based delivery in a familiar language may make the technique accessible in antenatal settings and at home. The supplied dissertation proposed that guided imagery could reduce perceived stress and support improved blood pressure readings when added to routine antenatal care. The present article reports the study conducted at RGGWCH, Puducherry, evaluating guided imagery among antenatal mothers diagnosed with PIH.

Aim and Objectives

The aim was to evaluate the effectiveness of guided imagery on blood pressure and stress among antenatal mothers with PIH.

To assess pre-test blood pressure and stress in the experimental and control groups.

To compare blood pressure and stress outcomes following guided imagery between the groups.

To examine the correlation between stress and blood pressure in both groups.

To identify associations between post-test outcomes and selected demographic and clinical variables in the experimental group.

Methods

Design and setting

A quantitative true-experimental pre-test and post-test control-group design was reported. The study was conducted in the antenatal outpatient department of Rajiv Gandhi Government Women and Children Hospital, Puducherry.

Participants and sampling size

The sample comprised 70 antenatal mothers with PIH: 35 in the experimental group and 35 in the control group. The dissertation reports that sample size was estimated using 80% power and a 95% confidence level, yielding approximately 32 participants per group; the final sample was increased to 35 per group to allow for an anticipated 10% attrition. Inclusion criteria were gestational age of 24–36 weeks, mild or moderate PIH, willingness to participate, ability to use a smartphone and WhatsApp, and primigravida or multigravida status. Exclusion criteria were severe PIH, hearing impairment, mental challenge, and concurrent use of other non-pharmacological relaxation approaches such as yoga or meditation.

Sampling and allocation

Simple random sampling was described. Eligible mothers were assigned identification numbers and selected by lottery. The dissertation states that 14 mothers were selected per day and then allocated equally to the experimental and control groups over five consecutive days.

Measures

Demographic and clinical information was collected using a structured proforma. Blood pressure was measured with a calibrated sphygmomanometer and categorized using the classification stated in the dissertation. Stress was measured using the 35-item Pregnancy Stress Rating Scale (PSRS), attributed in the dissertation to Chung-Hey Chen (1983). Each item was scored from 0 to 4, giving a maximum score of 140. Reported categories were mild (≤46), moderate (47–94) and severe (95–140). Internal consistency was reported as Cronbach's alpha=0.82.

Intervention and data collection

The experimental group received Tamil audio-based guided imagery in a quiet and comfortable setting. Participants were asked to sit comfortably, close their eyes, practise slow breathing and visualize pleasant, peaceful scenes while listening to the recording. Each session lasted approximately 20–30 minutes. The control group received routine antenatal care. Blood pressure and stress were assessed before the intervention and on days 7 and 15.

Ethical considerations

The dissertation reports approval from the Institutional Ethics Committee of MTPG & RIHS (No. 3474/IEC-17/CON-MTPGRIHS/2023), institutional and hospital permissions, and written informed consent from participants. Confidentiality, anonymity and the right to withdraw were stated to have been maintained.

Statistical analysis

Descriptive statistics included frequency, percentage, mean and standard deviation. Inferential analyses included chi-square tests, paired and unpaired t-tests, repeated-measures ANOVA with post-hoc comparisons, and Karl Pearson's correlation coefficient. The dissertation does not consistently identify the software or the alpha threshold for every analysis.

RESULTS

The study included 70 antenatal mothers, with 35 participants in each group. At baseline, the groups were reported to be comparable for systolic blood pressure, diastolic blood pressure and stress. The source tables nevertheless show marked differences in several clinical and demographic distributions; these are noted under the data-quality considerations below.

Table 1: Frequency and percentage distribution of demographic variables of antenatal mothers (N=70)

Variable	Category	Experimental (n=35), f (%)	Control (n=35), f (%)	χ^2 and p-value
Age (years)	18–22	1 (2.9)	0 (0.0)	χ^2=1.856; p=0.603 (NS)
	23–26	26 (74.3)	27 (77.1)	
	27–30	6 (17.1)	8 (22.9)	
	31–34	2 (5.7)	0 (0.0)	
Region	Urban	29 (82.8)	34 (97.1)	χ^2=2.882; p=0.090 (NS)
	Rural	6 (17.2)	1 (2.9)	
Education	Middle school	1 (2.9)	0 (0.0)	χ^2=7.214; p=0.125 (NS)
	High school	5 (14.3)	0 (0.0)	
	Higher secondary	22 (62.9)	17 (48.6)	
	Undergraduate	7 (20.0)	15 (42.9)	
	Postgraduate and above	0 (0.0)	3 (8.6)	
Religion	Hindu	23 (65.7)	14 (40.0)	χ^2=5.873; p=0.053 (NS)
	Christian	10 (28.6)	12 (34.3)	
	Muslim	2 (5.7)	9 (25.7)	
	Others	– (–)	– (–)	
Family	Nuclear family	26 (74.3)	18 (51.4)	χ^2=3.891; p=0.143 (NS)
	Joint family	9 (25.7)	17 (48.6)	
	Extended joint family	– (–)	– (–)	
Income per month	₹10,000–20,000	13 (37.1)	2 (5.7)	χ^2=3.247; p=0.072 (NS)
	₹20,001–30,000	22 (62.9)	33 (94.3)	
	₹30,001–40,000	– (–)	– (–)	
	Above ₹40,000	– (–)	– (–)	
Occupation	Government employee	1 (2.9)	0 (0.0)	χ^2=6.125; p=0.089 (NS)
	Private employee	13 (37.1)	0 (0.0)	
	Housewife	21 (60.0)	35 (100.0)	
Type of diet	Vegetarian	1 (2.9)	4 (11.4)	χ^2=1.965; p=0.161 (NS)
	Non-vegetarian	34 (97.1)	31 (88.6)	

Table 2: Frequency and percentage distribution of clinical variables of antenatal mothers (N=70)

Clinical variable	Category	Experimental (n=35), f (%)	Control (n=35), f (%)	χ^2 and p-value
Weight (kg)	46–55	7 (20.0)	0 (0.0)	χ^2=8.818; p=0.032 (labelled NS in source)
	56–65	9 (25.7)	9 (25.7)	
	66–75	19 (54.3)	25 (71.4)	
	>75	0 (0.0)	1 (2.9)	
Height (cm)	130–140	–	–	χ^2=1.927; p=0.381 (NS)
	141–150	5 (14.2)	13 (37.1)	
	151–160	29 (82.9)	22 (62.9)	
	161–170	1 (2.9)	0 (0.0)	
BMI (kg/m²)	<18.5	–	–	χ^2=3.102; p=0.212 (NS)
	18.6–24.5 (Normal)	2 (5.7)	30 (85.7)	
	25–29.9 (Overweight)	32 (91.4)	5 (14.3)	
	>30 (Obese)	1 (2.9)	0 (0.0)	
Gravida	Primigravida	23 (65.7)	35 (100.0)	χ^2=1.846; p=0.174 (NS)
	Multigravida	12 (34.3)	0 (0.0)	
Gestational week	24–29 weeks	3 (8.6)	34 (97.1)	χ^2=2.731; p=0.255 (NS)
	29–32 weeks	8 (22.9)	1 (2.9)	
	33–36 weeks	24 (68.6)	0 (0.0)	
Type of pregnancy	Planned	34 (97.1)	1 (2.9)	χ^2=0.894; p=0.344 (NS)
	Unplanned	1 (2.9)	34 (97.1)	
Previous mode of delivery	Normal vaginal delivery	0 (0.0)	0 (0.0)	χ^2=1.563; p=0.458 (NS)
	LSCS	12 (34.3)	0 (0.0)	
	Not applicable	23 (65.7)	35 (100.0)	
History of complications	Yes	1 (2.9)	0 (0.0)	χ^2=0.287; p=0.592 (NS)
	No	34 (97.1)	35 (100.0)	
Alternative therapy	Yes	–	–	χ^2=3.303; p=1.000 (NS)
	No	35 (100.0)	35 (100.0)	

Table 3: Comparison of mean blood pressure and stress scores across assessments (N=70)

Outcome	Group	Assessment	Mean ± SD	Repeated-measures ANOVA
SBP (mmHg)	Experimental	Pretest	152.80 ± 6.08	F=68.96; p=0.0001 (S)
	Experimental	Post-test 1 (7th day)	142.37 ± 5.73	
	Experimental	Post-test 2 (15th day)	132.23 ± 5.71	
	Control	Pretest	150.94 ± 5.94	F=1.638; p=0.209 (NS)
	Control	Post-test 1 (7th day)	147.83 ± 6.04	
	Control	Post-test 2 (15th day)	140.74 ± 5.96	
DBP (mmHg)	Experimental	Pretest	90.66 ± 5.71	F=56.72; p=0.0001 (S)
	Experimental	Post-test 1 (7th day)	84.34 ± 5.56	
	Experimental	Post-test 2 (15th day)	81.66 ± 6.66	
	Control	Pretest	89.03 ± 5.10	F=0.146; p=0.717 (NS)
	Control	Post-test 1 (7th day)	89.00 ± 4.89	
	Control	Post-test 2 (15th day)	88.97 ± 4.88	
Stress score	Experimental	Pretest	77.89 ± 11.99	F=74.77; p=0.0001 (S)
	Experimental	Post-test 1 (7th day)	65.11 ± 12.35	
	Experimental	Post-test 2 (15th day)	56.03 ± 10.80	
	Control	Pretest	79.51 ± 9.36	F=2.405; p=0.125 (NS)
	Control	Post-test 1 (7th day)	79.34 ± 9.20	
	Control	Post-test 2 (15th day)	79.11 ± 8.77	

DISCUSSION

The study found a marked increase in knowledge and attitude scores following the video-assisted teaching programme. Before the intervention, all participants were categorized as having inadequate knowledge, and three-quarters had a neutral attitude while one-quarter had a negative attitude. At post-test, over two-thirds were categorized as having adequate knowledge and 95% as having a positive attitude. These descriptive changes are consistent with the study's stated objective of evaluating a structured educational intervention.

The reported mean scores also increased between assessments: knowledge rose from 21.91 to 73.98, and attitude rose from 43.92 to 82.95. The report compares these findings with earlier educational studies among textile workers, including studies by Jessica S. Kale and Akash H. A. that reportedly found improved occupational-health knowledge after teaching interventions. Such comparisons are contextual rather than direct evidence of equivalence, because the designs, instruments, and settings may differ.

The reported correlation of r=0.51 suggests a moderate positive association between post-test knowledge and attitude in this sample. Educational qualification and years of work experience were reported to be associated with both outcomes, whereas age and sex were not. These associations should be interpreted cautiously because the source does not provide full contingency tables or exact p values, and the sample was drawn from one industry.

The findings are limited by the one-group pre-test–post-test design, absence of a comparison group, short one-week follow-up, and reliance on questionnaire scores. Without a control group, changes cannot be attributed exclusively to the intervention, and the study did not report whether knowledge or attitudes translated into sustained protective practices or reduced occupational injuries or illness. In addition, the source contains a conflicting p-value notation for the knowledge comparison and some inconsistencies in health-history reporting. These should be checked against the original records before submission.

CONCLUSION

In this study, guided imagery delivered alongside routine antenatal care was associated with statistically significant reductions in systolic blood pressure, diastolic blood pressure and stress among antenatal mothers with PIH in the experimental group. The findings support further evaluation of guided imagery as a complementary nursing intervention. Larger, rigorously reported studies with longer follow-up and maternal–fetal outcomes are required before drawing conclusions about its broader clinical effectiveness.

Implications for nursing practice

- Nurses may consider offering structured relaxation education and guided imagery as an adjunct to prescribed antenatal care, where clinically appropriate.
- Training may be provided to nurses in delivering standardized audio-guided relaxation sessions and documenting participation.
- Any relaxation intervention should be integrated with, not substituted for, routine blood pressure surveillance, medical

assessment and prescribed treatment.
- Further controlled research should assess adherence, safety, longer-term maternal outcomes and fetal outcomes.

Limitations

- The study was conducted in a single tertiary-care hospital with a total sample of 70 participants.
- Follow-up was limited to 15 days.
- The source report contains inconsistencies in the intervention schedule and some statistical descriptions.
- Marked differences in several baseline clinical characteristics may limit the strength of between-group causal interpretation.
- Maternal and fetal clinical outcomes and adverse events were not adequately reported in the main results.

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Cite this article as: Bherleene. J, Jalaja rani, Saradha, Felicia chithra (2026). 'Effectiveness of guided imagery on blood pressure and stress among antenatal mothers with pregnancy-induced hypertension: a true experimental study in Puducherry'. International Journal of Innovative Research in Health Science, 2(11), 1-7

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