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ORIGINAL RESEARCH

Sweet Expectation and Positive Thinking: The Use of Mandalas in Labor Induction. A Randomized Pilot Clinical Study

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Purpose: Labor induction is one of the most common medical interventions in obstetric practice and is often associated with feelings of pressure and lack of control. Mandala coloring or drawing is considered a meditative practice that may help express emotions, calm the mind, and promote awareness. The primary aim of this study was to evaluate the efficacy of Mandala coloring in improving the labor experience in nulliparous women undergoing induction. A secondary aim was to assess its effects on birth outcomes and analgesia requests.

Patients and Methods: We conducted a monocentric, parallel-group randomized clinical trial. Patients in the intervention group (Group A; n = 26) received standard induction care plus Mandala coloring materials, while the control group (Group B; n = 26) received standard care only. The primary outcome was measured using the Childbirth Experience Questionnaire (CEQ), a 22-item self-administrated survey useful to asses a woman's satisfaction with her labor and delivery experience. Secondary outcomes were recorded in a dedicated database.

Results: The average CEQ score was 69.31 (SD 5.08) in Group A and 68.84 (SD 8.32) in Group B (P=0.81). Analgesia was requested by 15 women (57.7%) in Group A and 13 (50.0%) in Group B (P=0.33). In Group A, there were 17 spontaneous deliveries (65.4%), 5 operative deliveries (19.2%), and 4 Cesarean sections (15.4%). In Group B, 20 spontaneous deliveries (76.9%), 1 operative delivery (3.8%), and 5 Cesarean sections (19.2%) were observed (P=0.22).

Conclusion: The results did not show statistically significant differences between the two groups in terms of the birth experience, obstetric outcomes, and the request for labor analgesia. However, the small difference observed in favor of the experimental group might indicate a positive trend which could become more evident in a study with greater statistical power and warrant further investigation.

Keywords: obstetric, experience childbirth, coloring, latency, nulliparous, analgesia

Introduction

Background

Labor induction is one of the most frequent medical interventions in daily obstetric clinical practice and in the last decades an increasing number of this procedure has been registered. Its aim is to stop pregnancy evolution and to achieve an active labor in conditions of maternal-fetal well-being.[1]

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WHO recommends considering women's nursing care lived experience as important as clinical care.[2] Moreover, a positive childbirth experience is a good indicator for women who decide to have more children, and it is positively related to the establishment of maternal bonding as well as maternal confidence in breastfeeding.[3,4]

As a consequence, a negative childbirth experience, in addition to negatively influencing the decision to have another child, also affects the well-being of the mother and leads to high levels of anxiety.[5] The feeling of control and participation in choosing on your own childbirth experience is related to a positive one.[6]

Lack of participation in the decisional process has a negative impact on the experience of the women who are subjected to labor induction as well as the lack of information about risks and benefits and quick and incomplete discussions:[7] the decisional process is often not shared, and it seems to be mostly influenced by clinical factors rather than the patient's wishes.[8]

The risk of labor induction is different between nulliparous women and multiparous ones. Nulliparous women's risk is generally higher, while multiparous women's risk is linked to their socioeconomic status. Among socioeconomic status indicators, maternal education, professional qualification and deprivation of the right to vote have a significant correlation to the risk of labor induction. This stresses the importance of focusing on environmental factors and on patients' education level in order to increase healthcare professionals' commitment in counselling and to support clinical decisions.[9]

Antenatal steps should be also redesigned and including detailed counselling about labor induction.[8] Lack of support in antenatal steps is one of the most frequent factors related to dissatisfaction after labor induction in nulliparous women, while an induction up to 24 hours or longer is the cause of dissatisfaction in multiparous ones.[10]

Labor induction duration and its side effects are usually viewed as uncomfortable and traumatic. More information and communication about alternative procedures such as castor oil, acupuncture, clove oil and homoeopathy are related to a positive labor induction experience so much that patients say they would choose it again and recommend it to friends.[11]

About the labor duration, a survey conducted on 200 patients (103 induced labors vs 97 spontaneous labors) showed a significant longer duration of the first stage of labor in the induced group ($p<0,0001$), while the duration of the second stage of labor was similar in the two groups ($p= 0.85$).[12] However, a subsequent study revealed that the duration of the first stage of labor is similar in induced or spontaneous labor.

Induced patients have lower levels of safety perception and sense of participation during labor. This should sensitize midwives and healthcare professionals involved in the procedure to provide better support.[13]

In 2020, 18.396 women were involved in a study whose aim was to assess labor experience (induced vs spontaneous) by VAS scale (zero most negative experience ever, 10 most positive experience ever). 4.5% showed a low VAS score and induced women were less satisfied than the women with spontaneous labor [7,5% vs 3,2%; $p < 0.001$].[14]

There are many tools related to a positive experience in an induced delivery[15] such as receiving clear information, discussing worries and feelings and providing accessible areas for women's mobilization and peaceful spaces where relaxing and sleeping.

Another way to supply a positive birth experience to women can be represented by art therapy which nowadays has gained recognition as a practical and applicable approach in addressing a variety of physical and psychological conditions, providing benefits such as relief from anxiety and depression symptoms, enhanced quality of life, and increased perception of well-being and helpfulness in patients.[16] In this context, Mandala takes place.

The word Mandala means "round shape" in Sanskrit. The patterns consist of symbols that depict the universe and spirituality through the different circles and shapes contained in the pattern itself.

Mandala coloring or drawing is considered a form of meditation that can facilitate the expression of emotions, calm the mind and raise awareness.[17]

A previous Turkish study tested the effect of Mandala coloring on the fear of childbirth. The study revealed that the fear of childbirth of pregnant women who additionally colored Mandalas in antenatal education classes decreased more than that of ones who received standard antenatal education. This benefit was demonstrated prenatally, during labor and delivery and measured in the early postpartum period.[18]

Other studies investigating the effects of Mandala coloring have found that it may reduce perceived stress levels and may promote mental well-being in nurses working in hospitals,[18] could be a valuable complementary approach in perioperative care for addressing the psychological needs of women with gynecological cancer[19] and may be effective in reducing anxiety and depressive symptoms in adolescents with cancer.[20]

In the light of all these results and of the multidimensional nature of childbirth, shaped by emotional, relational, environmental and cultural factors, Mandala coloring may be used as a supportive non pharmacological tool to improve birth experience. The lack of studies which investigate the usage of Mandala coloring during labor induction make further investigations necessary for define its potential benefits in this delicate phase of woman's experience.

Objectives

The primary aim of this study was to evaluate the efficacy of Mandala coloring in improving labor experience in nulliparous women involved in labor induction.

A secondary aim was to evaluate the effects of Mandala coloring on birth outcomes and requests for analgesia.

Materials and Methods

Study Design, Randomisation and Blinding Procedures

We conducted a monocentric, parallel group randomised clinical trial (Figure 1) and (File S1) from February 2024 to February 2025 at the Degli Infermi Hospital in Ponderano, part of the Biella Local Health Authority (ASL). The study protocol and related documents were approved by Ethical Review Board of Novara (approval number CE069/2023). The study was conducted in accordance with the Declaration of Helsinki and Good Clinical Practice guideline. Informed consent was provided by all patients at enrollment. The study was registered at ClinicalTrials.gov under the identifying number NCT06122168 (File S2). The study design is shown in Figure 2. In order to achieve the desired results, a convenience sample was collected. Specifically, all women hospitalised in the Obstetrics and Gynecology department of the ASL of Biella, until the sample size of 26 patients for each group was completed, who met the inclusion criteria outlined in the protocol. In order to assign the patients to one of the two groups, sealed envelopes were generated, equal in number to the expected participants in the study. Inside the envelopes were the labels "CONTROL" or "INTERVENTION" to identify the group of assignment; it was not possible to change the allocation sequence based on the preferences of the patient or the team. The sealed envelopes were generated by a team separate from the one responsible for data management. The envelopes, which were identical in shape and colour, were shuffled and then delivered and stored in a locked drawer, accessible only to the individual designated as responsible for data management (according to the protocol). The allocation to one of the two groups, after opening the sealed envelope, was determined by the obstetric/gynecological staff following the evaluation of the inclusion criteria.

Registration ClinicalsTrial.gov NCT06122168

Protocol CE069/2023

Participants

The main inclusion criteria were as follows: pregnant women, nulliparous, aged between 18 and 45 years, hospitalized due to the need for labor induction for medical reasons, carrying a singleton fetus in a cephalic presentation, with a gestational age of $\geq$ 37 weeks, and providing written informed consent to participate in the study. Patients were excluded if they required induction with oxytocin as the primary intervention, as these patients necessitate simultaneous cardiotocographic monitoring during induction, which restricts mobility. Prenatal fetal complications, such as severe intrauterine growth restriction (IUGR), suspicious or non-reassuring cardiotocography findings upon admission, inability to understand the questionnaire and the provided informational material and any admissions for reasons other than induction, although later resulting in labor induction after further assessment, were also exclusion criteria.

Interventions and Controls

The patients assigned to the intervention group received standard induction management along with the delivery of the Mandala (Figure 3).

The standard management included, upon admission, a verbal consultation with the doctor and midwife regarding the induction procedure (Time 1), specifically:

- Explanation of the diagnosis requiring labor induction;

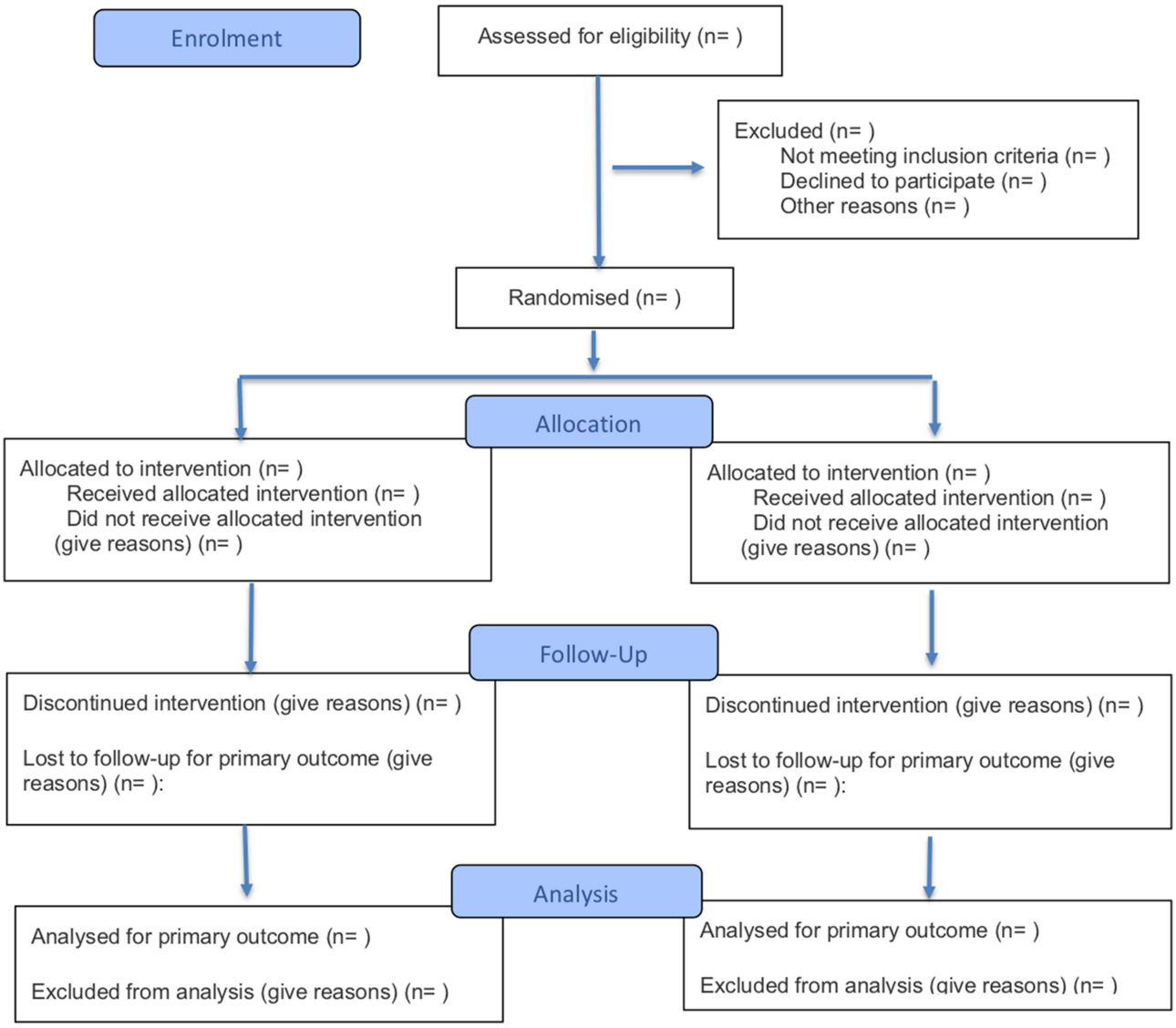

Figure 1 CONSORT flow diagram showing the progress through the phases of a randomized trial with two groups, including enrollment, intervention allocation, follow-up, and data analysis. Adapted from: Hopewell S, Chan AW, Collins GS, Hróbjartsson A, Moher D, Schulz KF et al. CONSORT 2025 Statement: updated guideline for reporting randomized trials. BMJ. 2025;388:e081123. https://doi.org/10.1136/bmj-2024-081123.

- Induction timeline;
- Induction methods;
- Type of obstetric/medical care and monitoring;
- Possibility of partner support;
- Information related to the hospital stay;
- Verbal and written information about the study and a request for participation. Time 1 concluded with the potential signing of the consent form for participation in the study.

Time 2, shortly before induction, was dedicated to obtaining written informed consent for the induction procedure, with verbal and written explanations about possible complications.

Time 3: At the end of the induction procedure, the patient was invited to return to the hospital room, where the intervention phase began with the delivery of the Mandala and colouring materials. The type of colouring and the time

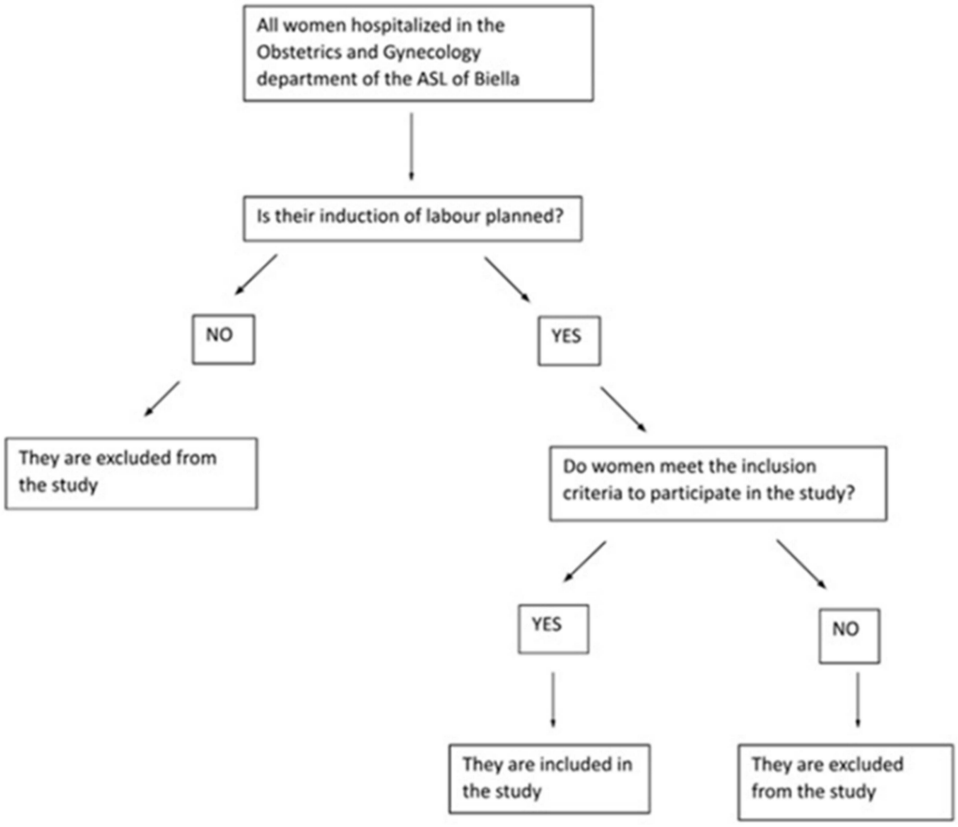

Figure 2 Flowchart illustrating the study design and the inclusion/exclusion criteria applied to women hospitalized in the Obstetrics and Gynecology department of ASL di Biella. Women with planned induction of labor who met the inclusion criteria were enrolled, while those without planned induction or not meeting the criteria were excluded.

spent colouring the Mandala depend on the woman and are entirely subjective. During the phases preceding labor, except for the time spent colouring the Mandala, the patient received standard care as outlined in the department's induction protocol.

Control group: Followed the full standard management of hospitalisation, informed consent, and post-induction care (Time 1, 2, and 3) as in the intervention group but did not receive the mandala. For further details, please refer to the flow chart in Figure 4.

Outcomes

Primary outcome: evaluation of the childbirth experience.

Secondary outcome: type of delivery, request for obstetric analgesia.

Measurement of Outcomes

The primary outcome was measured using a validated questionnaire, the Childbirth Experience Questionnaire (CEQ). This was provided to the patients, who were asked to complete it within 12–24[21] hours after childbirth. Data related to the secondary outcomes were entered into a specially created database and extracted from the medical records.

Sample Size and Statistical Methods

Potential confounding variables were collected through a baseline questionnaire, and, in case of statistically significant differences between the experimental and control groups (p value < 0.05) adjustments were made using stratification or logistic regression.

Primary outcome: We estimated the weighted mean difference (WMD) in CEQ scores between the two groups under study, accounting for group-specific variances.

Figure 3 Example of a Mandala image used as a visual support tool in the intervention group during labor induction.

Secondary outcomes: The results were presented as cumulative incidences in both groups and relative risks with their respective 95% confidence intervals for dichotomous variables. For continuous variables, means and standard deviations were presented for both groups, and the WMD with its 95% confidence interval was used as a summary measure.[22,23]

Results

Participant Flow

Throughout the study, a total of 52 women met the inclusion criteria. They were divided into two groups: Group A (Intervention Group) and Group B (Control Group). Both Group A and Group B consisted of 26 women. In Group B, 1 patient did not receive the questionnaire due to the baby transfer to another hospital.

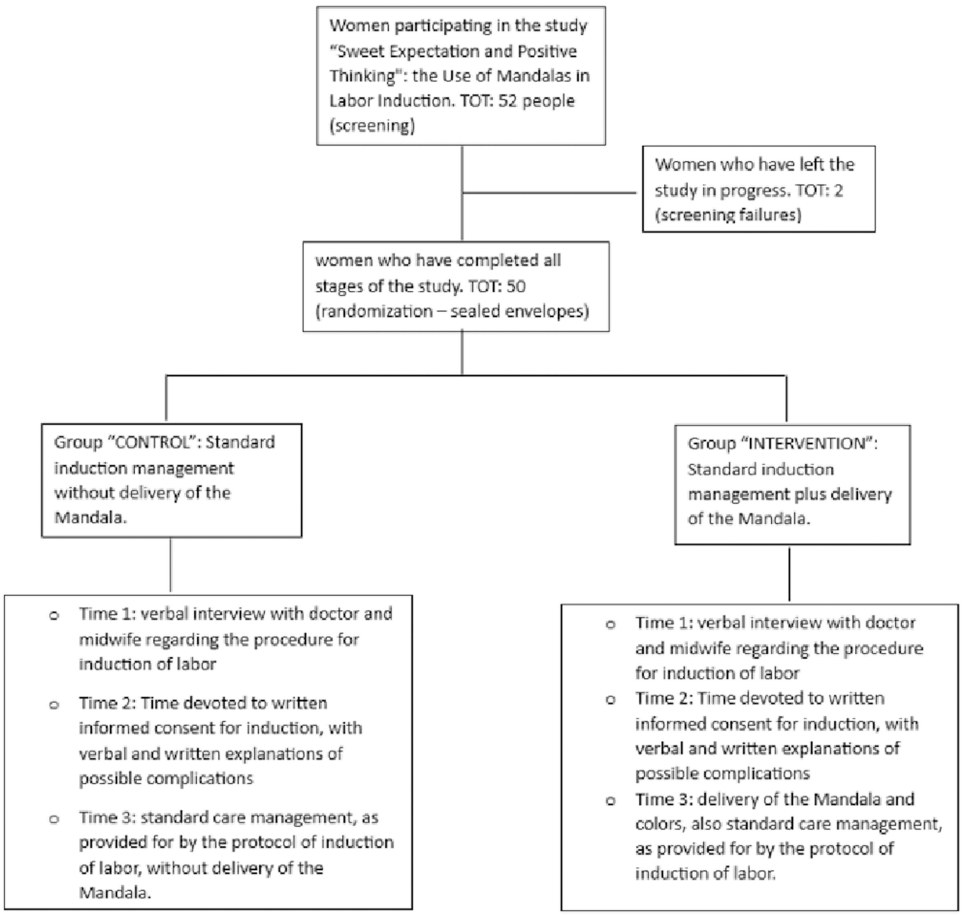

Figure 4 Flowchart illustrating the intervention and control procedures. The control group received standard labor induction management without the Mandala, while the intervention group received standard management plus Mandala use. Both groups underwent verbal interviews, provided informed consent, and received standard care in accordance with the induction protocol.

Recruitment

The recruitment took place from February 2024 to February 2025.

Intervention and Comparator Delivery

Group A received Mandala at the beginning of labor induction.

The questionnaire (CEQ) was provided to Group A and Group B after delivery, and patients completed it within 12–24 hours after childbirth.

Baseline Data

The baseline characteristics of the study population are shown in Table 1.

All the 26 patients (100%) of Group A were Caucasian, while in Group B, 25 patients were Caucasian (96.2%) and 1 was Arab (3.8%). [P= 0.31].

In Group A, 17 women were unmarried (65.4%), 7 married (26.9%), 1 separated (3.8%) and 1 divorced (3.8%). Of the 26 patients in Group B, 17 were unmarried (65.4%) and 9 were married (34.6%). There were no separated or divorced women in Group B. [P=0.52].

8 patients (30.8%) in Group A had a University degree, 14 had a High School degree (53.8%), 3 had a Middle School Diploma (11.5%), and 1 had no qualification (3.8%). In Group B, 11 patients had a university degree (42.3%), 11 had a High School degree (42.3%), and 4 had a Middle School Diploma (15.4%). [P= 0.58].

Table 1 Baseline Characteristics of Participants in the Intervention and Control Groups. Data are Expressed as Counts and Percentages Unless Otherwise Specified

Characteristic	Intervention n (%)	Control n (%)	N	p
Ethnicity			26	0.31
Caucasian Arabic	26 (100) 0 (0.00)	25 (96.2) 1 (3.8)		
Marital Status			26	0.52
Unmarried Married Separated Divorced	17 (65.4) 7 (26.9) 1 (3.8) 1 (3.8)	17 (65.4) 9 (34.6) 0 (0.00) 0 (0.00)		
Qualification			26	0.58
University degree High School degree Middle School Diploma Elementary School Diploma No qualification	8 (30.8) 14 (53.8) 3 (11.5) 0 (0.00) 1 (3.8)	11 (42.3) 11 (42.3) 4 (15.4) 0 (0.00) 0 (0.00)		

Abbreviations: SD, Standard Deviation; SMD, Standardized Mean Difference; CI, Confidence Interval.

The average age was 33.58 (SD 5.76) in Group A and 32.19 (SD 5.98) in Group B [P= 0.39, SMD (IC 95%) = 1.39 (−1.88–4.65)].

The average gestational age was 39.86 (SD 1.46) in Group A and 39.62 (SD 1.30) in Group B [P= 0.55, SMD (IC 95%) = 0.23 (−0.54–1.00)].

Numbers Analysed, Outcome and Estimation

In Group A, 24 patients (92.3%) were induced for late term pregnancy, 1 (3.8%) for Gestational Diabetes and 1 (3.8%) for fetal biometry parameters (biparietal diameter, head circumference, abdominal circumference and femur length) over the 90th centile. There were 23 (88.5%) labor inductions for late term pregnancy, 1 (3.8%) for Gestational Diabetes and 1 (3.8%) for obesity in Group B. [P= 0.50].

The Cook Balloon (Cervical Repening Balloon – CRB) was used in 3 patients (11.5%) in Group A and in 5 patients (19.2%) in Group B. 21 women (80,8%) were induced with Angusta (oral Misoprostol) in both Group A and Group B. Oxytocin used as a labour acceleration and Amniorrhexis were used for 1 labor induction (3.8%) each in Group A. [P= 0.47].

In Group A, there were 17 spontaneous vaginal deliveries (65.4%), 5 operative vaginal deliveries (19.2%) and 4 Cesarean sections (15.4%). In Group B, there were 20 spontaneous vaginal deliveries (76.9%), 1 operative vaginal delivery (3.8%) and 5 Cesarean sections (19.2%). [P= 0.22].

15 women (57.7%) asked for analgesia in Group A and 13 (50.0%) in Group B [P=0.33].

The average CEQ score was 69.31 (SD 5.08) in Group A and 68.84 (SD 8.32) in Group B [P= 0.81, SMD (IC 95%)= 0.47 (−3.39–4.33)].

The average dilation at hospitalization was 0.88 cm (SD 0.59) in Group A and 0.69 cm (SD 0.68) in Group B [P= 0.28, SMD (IC 95%)= 0.19 (−0.16–0.55)].

Finally, the average time between induction and the start of the partograph was 1916.54 minutes (SD 1088.58) in Group A and 1368.46 minutes (SD 1124.93) in Group B [P= 0.08, SMD (IC 95%)= 548.07 (−68.51–1164.70)].

The intrapartum characteristics of the study population are summarized in Table 2.

Table 2 Intrapartum Characteristics of Participants in the Intervention and Control Groups. Data are Expressed as Counts and Percentages Unless Otherwise Specified

Characteristic	Intervention n (%)	Control n (%)	N	p-value
Induction reason			26	0.50
Late term pregnancy	24 (92.3)	23 (88.5)		
Gestational Diabetes	1 (3.8)	2 (7.7)		
Fetal biometry parameters > 90th	1 (3.8)	0 (0.00)		
Obesity	0 (0.00)	1 (3.8)		
Induction type			26	0.47
CRB	3 (11.5)	5 (19.2)		
Misoprostol	21 (80.8)	21 (80.8)		
Amniorrhexis	1 (3.8)	0 (0.00)		
Oxytocin	1 (3.8)	0 (0.00)		
Delivery			26	0.22
Spontaneous delivery	17 (65.4)	20 (76.9)		
Operative delivery	5 (19.2)	1 (3.8)		
C-section	4 (15.4)	5 (19.2)		
Analgesia			26	0.33
No	11 (42.3)	13 (50.0)		
Yes	15 (57.7)	13 (50.0)		

Notes: Definitions: Partograph: a graphic chart used to record labor events and monitor the progress of childbirth. It is started at the onset of the active phase of labor.
Abbreviations: CEQ, Childbirth Experience Questionnaire; SD, Standard Deviation; SMD, Standardized Mean Difference; CI, Confidence Interval.

Discussion

Interpretation

The aim of this study was to evaluate the clinical effectiveness and the impact on the birth experience of using an artistic tool, the colouring of a Mandala, compared to standard management in nulliparous patients undergoing labor induction. The results, extrapolated from a selected population of the 815 deliveries of Biella's Hospital in 2023, did not show statistically significant differences between the two groups in terms of the birth experience, obstetric outcomes, and the request for labor analgesia. However, it is important to carefully analyse the clinical significance of these data, considering the methodological context and the current state of the literature.

The comparison between the groups showed no statistically significant differences in the average scores on the CEQ (69.31 ± 5.08 in the Mandala group vs 68.84 ± 8.31 in the control group). This suggests that, based on the data collected, the intervention did not produce a measurable effect on the subjective birth experience compared to standard care. However, it is crucial to distinguish between the absence of statistical significance and the absence of a clinical or subjective effect. The small difference observed in favor of the experimental group might indicate a positive trend, which could become more evident in a study with greater statistical power. The lack of significance can be primarily attributed to the limited sample size, which reduces the power of the study and the ability to identify real differences. Furthermore, the effect of the artistic intervention could be subtle, individual, or psychologically complex, and therefore not fully detectable with a standardised quantitative tool like the CEQ, which, although validated, has a rigid structure in assessing multidimensional experiences like labor.

In the literature, several studies confirm the complexity of the birth experience in the case of induction: it has been highlighted, for instance, that primiparous women undergoing induction may perceive their labor experience less positively compared to spontaneous labor, and that the methods of induction (misoprostol vs balloon catheter) can

influence the perception of control and active participation during labor.[24] Other authors emphasise that induction can be experienced ambivalently, even in the context of good care, and that the subjective experience depends not only on clinical outcomes but also on communication, support received, and involvement in the decision-making process.[25,26]

In this perspective, the results of our study fit into the broader context of research on the birth experience in the case of induction. A large-scale retrospective study conducted on over 95,000 women in Finland showed that labor induction is associated with a worse birth experience compared to spontaneous labor, regardless of the mode of delivery.[27] The data suggest that induction itself is a risk factor for a negative experience, confirming what has also been found in more recent studies. In this context, non-pharmacological interventions aimed at reducing anxiety, improving the perception of control, and promoting relaxation, such as mandala colouring, could play a role in mitigating the potentially unfavourable psychological effects of induction. Although our study did not show a significant impact on clinical outcomes or the quantitative assessment of the birth experience, the integration of these tools in induction care could contribute to a more personalised approach to care, taking into account the emotional vulnerabilities and expectations of patients. In light of the available evidence, it seems increasingly important to deepen the interaction between clinical and psychological variables in induction pathways, through study designs that combine objective and subjective measures in a complementary manner.

An interesting finding from the analysis concerns the average time between the initiation of induction and the start of the partograph: in the group that used the Mandala, this interval was longer (1916.54 ± 1088.57 minutes) compared to the control group (1368.46 ± 1124.93 minutes), with a one-sided p-value of 0.040. Although this data is statistically borderline and was not a predefined outcome, it warrants consideration. A longer latency between induction and the start of labor could theoretically reflect greater relaxation and less adrenergic activation, conditions associated with a better subjective birth experience. However, it is equally plausible that a longer time could indicate a less effective response to induction, potentially related to uncontrolled psychological or biological factors. In this sense, the effect of the artistic intervention on the physiology of labor remains ambiguous. It is known, for example, that high levels of maternal anxiety can influence various aspects of pregnancy, including fetal circulation patterns and obstetric management,[28] but it is still unclear whether practices such as mandala coloring have a direct impact on these physiological mechanisms. Some studies indicate a reduction in anxiety during pregnancy with this type of intervention,[29] but its influence on the outcome of induction has not yet been proven. This data should, therefore, be considered exploratory and could be better interpreted in future studies that also integrate hormonal, emotional, and clinical indicators of labor activity.

The analysis of obstetric outcomes (delivery outcome and request for labor analgesia) also did not show statistically significant differences between the groups. The data indicate a balanced distribution between those who requested or did not request analgesia and between the types of delivery. This suggests that the intervention had no direct and measurable impact on these clinical outcomes. However, these outcomes, although objective, do not encompass the subjective experience of the patient, which is often influenced by psycho-emotional elements that are difficult to quantify.

One of the strengths of our study is the adoption of a rigorous methodology: randomization was performed using closed envelopes, ensuring random allocation of subjects to groups, and data analysis was conducted in a blinded manner. Furthermore, the homogeneity of the groups at baseline, confirmed by non-significant p-values for all the analysed variables, supports the reliability of the comparison between the two groups and reduces the risk of bias.

The scientific literature on the use of art therapy during pregnancy, and specifically on Mandala colouring, is still in its early stages but shows promising results. A recent randomized study demonstrated a significant reduction in pregnancy-related anxiety through Mandala colouring in primiparous women.[29] A systematic review also highlighted psychological benefits associated with this practice in various clinical contexts, while recognising the need for further specific studies in obstetric settings.[30] Simple, non-invasive, and low-cost interventions like Mandala colouring could therefore represent a useful strategy for improving psycho-emotional well-being during the birth process, although their effect on clinical parameters remains to be explored.

Although our results do not show a statistically significant effect of the intervention, the absence of negative effects and the observation of a positive trend in terms of the experience suggest that Mandalas could be a useful tool in a broader strategy for humanising childbirth. Future studies with larger samples, multicenter designs, and the integration of qualitative measures (eg, interviews, focus groups) could better clarify the effectiveness and role of these interventions

in obstetric settings. The integrated use of artistic approaches fits within the paradigm of person-centred medicine, promoting the overall well-being of women at a highly significant moment like childbirth.

Limitations

The limited sample size reduces the power of the study and the ability to identify real differences.

Conclusions

This study did not aim to definitively demonstrate the clinical effectiveness of Mandala colouring in the context of labor induction. Rather, its main objective was to explore a largely unexamined area by introducing a potential artistic tool into obstetric care through a rigorous yet open approach to the complexity of the perinatal experience.

The results, although not statistically significant, suggest some interesting trends, particularly concerning the subjective experience and the latency time between induction and the onset of labor. Given the complex and multi-dimensional nature of the childbirth experience, shaped by emotional, relational, environmental, and cultural factors, Mandala colouring could be considered not as a standalone intervention but as part of a broader array of support strategies that deserve further investigation.

The main value of this work lies in laying the groundwork for future research, helping to stimulate scientific debate on alternative and humanised approaches to childbirth support. The interest generated by this study, suggests the potential for developing a multicenter project a larger sample and a more comprehensive methodological design in the future, including qualitative tools (such as other psychological and relational tools) and biomarkers of stress and well-being.

At a time when perinatal medicine is increasingly challenged to personalise and humanise care, the integration of simple, non-pharmacological, and low-cost artistic practices may offer a concrete opportunity to improve the childbirth experience while respecting women's subjectivity and central role; reducing anxiety during labor.

Data Sharing Statement

The authors intend to share individual deidentified participant data that support the findings of this study.

Data will be accessible upon reasonable request to the corresponding author, Dr. Alessandro Libretti (libretti.a@gmail.com), Department of Gynaecology and Obstetrics, University Hospital Maggiore della Carità, Novara, Italy.

Deidentified data will be available starting 6 months after publication and for 5 years thereafter.

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Author Contributions

All authors have read and agreed to the published version of the manuscript.

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The author(s) report no conflicts of interest in this work.

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