Midwifery Continuity of Care with the Use of Oxytocin Massage in the Postpartum Period

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ABSTRACT
Continuity of care in midwifery refers to comprehensive services provided continuously from pregnancy, childbirth, postpartum, breastfeeding, newborn care, and family planning. This study aimed to evaluate the application of oxytocin massage for postpartum mothers within the framework of continuity of care. The study employed a case report design using continuous midwifery management based on scientific evidence and was conducted from August to November 2024. The subject was a pregnant woman at 37 weeks of gestation who was followed until participation in postpartum family planning. The results of care were reported descriptively. During pregnancy, several problems were identified, including sleep disturbance, back pain, overweight status, mild anemia, and Braxton Hicks contractions. Intrapartum care focused on pain management using a birth ball. During the postpartum period (day 12 postpartum), insufficient breast milk production was identified. The intervention provided was oxytocin massage to improve milk production and flow. After the intervention, a significant improvement was observed, indicated by a questionnaire score increasing from 3 (poor milk flow) to 8 (adequate milk flow). In newborn care, weight loss was identified at 12 days of age, and education and counseling on infant nutrition were provided. For family planning care, Mrs. F chose an implant contraceptive method. All identified problems were successfully managed. As conclusion, continuity of care in midwifery combined with the application of oxytocin massage was effective in addressing maternal and neonatal problems, particularly in improving breast milk production and supporting successful breastfeeding outcomes.
Keywords: continuity of care; breastfeeding; postpartum period; oxytocin massage

INTRODUCTION
Continuity of care (COC) in midwifery refers to the provision of continuous and integrated services throughout pregnancy, childbirth, the postpartum and breastfeeding period, newborn care, and family planning, as a manifestation of high-quality, woman-centered care delivered by midwives. This model emphasizes consistency of caregivers, holistic monitoring, and sustained professional support across the reproductive continuum. For this reason, the World Health Organization has recommended that developing countries strengthen the implementation of continuous midwifery care to improve maternal and neonatal outcomes. The application of continuity of care is known to enhance women's childbirth experiences by providing not only physical assistance but also psychological support, emotional reassurance, and improved maternal well-being after delivery [1, 2].

Continuity of care encompasses services provided from pregnancy to family planning, and each phase requires careful clinical attention and monitoring. During pregnancy, several health problems may arise that can affect maternal and fetal outcomes. One of the most common conditions is anemia in pregnancy, defined as a reduction in red blood cell count or hemoglobin (Hb) level, resulting in decreased oxygen delivery to vital organs of both mother and fetus. Pregnant women are classified as anemic when Hb levels fall below 11 g/dL. Globally, the prevalence of anemia in pregnancy is estimated at 43.9%. In Indonesia, the prevalence reached 27.7% in 2023, while in West Java it was reported at 32.5% in 2020, indicating that anemia remains a significant public health concern requiring continuous monitoring during antenatal care [3].

In addition to anemia, overweight status before pregnancy is another maternal condition that may influence pregnancy outcomes. Overweight is defined as a pre-pregnancy body mass index (BMI) of 25–29.9 kg/m^2. This condition can increase the risk of complications such as gestational diabetes and hypertension in the mother, as well as fetal macrosomia. Fetal nutritional intake during pregnancy depends largely on maternal nutritional reserves that have accumulated since the preconception period. Therefore, to prevent adverse maternal and fetal outcomes related to nutritional imbalance, maternal weight gain during pregnancy must be monitored carefully and adjusted according to recommended guidelines [4].

Following antenatal care, services continue through childbirth and extend into the postpartum period. One of the most important aspects of postpartum care is breastfeeding. Lactation is the physiological process by which breast milk is transferred directly from the mother's breast to the infant. Milk production and ejection are regulated primarily by the hormones prolactin and oxytocin. After delivery, levels of estrogen, progesterone, and human chorionic somatomammotropin decline, while prolactin increases to stimulate milk synthesis in the mammary alveoli. This rise in prolactin is accompanied by increased oxytocin secretion, which facilitates milk ejection through the let-down reflex, thereby supporting effective breastfeeding [5].

Breast milk is the most optimal and complete source of nutrition for infants, particularly during the first six months of life. Exclusive breastfeeding has been proven to reduce infant morbidity and mortality while supporting optimal growth and neurodevelopment. However, many breastfeeding mothers encounter difficulties, one of the most frequent being insufficient milk production. This issue often occurs in the early postpartum period and is a major contributor to the failure of exclusive breastfeeding programs. Milk production is influenced by multiple factors, including maternal psychological status, hormonal balance, and environmental support. Oxytocin plays a critical role in stimulating milk release through the neuroendocrine reflex pathway. One non-pharmacological intervention known to stimulate oxytocin release is oxytocin massage [6].

Oxytocin massage is a therapeutic technique performed along the spinal column, beginning from the vertebral region of the upper back and extending to approximately the fifth or sixth rib. This massage stimulates the parasympathetic nervous system, which originates from the medulla oblongata and the sacral region of the spinal cord. Neural stimulation is then transmitted to the hypothalamus and subsequently to the posterior pituitary gland, triggering the release of oxytocin and facilitating breast milk ejection [5].

In 2023, the national coverage of exclusive breastfeeding among infants aged six months reached 63.9%, exceeding the annual program target of 50%. In West Java, the rate was even higher at 67.2%. Despite these achievements, maintaining consistent exclusive breastfeeding remains challenging, particularly among mothers experiencing low milk production or breastfeeding difficulties during the postpartum period [7].

Based on the considerations above, the author conducted a continuity of care midwifery case report, including the application of oxytocin massage during the postpartum period, at Majalaya Primary Health Center, Bandung Regency. The study aimed to evaluate how continuous midwifery care combined with oxytocin massage could support maternal recovery and improve breastfeeding outcomes.

METHODS
This study is a case study report employing a continuity of midwifery care approach. The purpose of this report is to provide a comprehensive description of midwifery care covering antenatal care, childbirth, postpartum care, newborn care, and family planning through the application of continuous, evidence-based midwifery management. Care was provided within the service area of Majalaya Primary Health Center, Bandung

Regency, from August to November 2024. The subject of care was Mrs. F, who received midwifery care starting from 37 weeks of gestation until the postnatal family planning period. Care was also provided to the newborn from birth until completion of BCG and Polio 1 immunizations.

Data collection techniques included primary data obtained from interviews, physical examinations, and supporting clinical examinations. Secondary data were collected from the Maternal and Child Health (MCH) handbook and documented care records. All care activities were documented using the SOAP format (Subjective, Objective, Assessment, Plan). Instruments used in this report included standardized formats for pregnancy, childbirth, postpartum care, newborn care, family planning, and a specific evaluation instrument in the form of an Exclusive Breast Milk Output Questionnaire.

The selection of oxytocin massage as an intervention was determined based on an evidence-based practice review using the PICO framework (Patient, Intervention, Comparison, Outcome). The clinical question formulated was: P (Patient/Problem): Postpartum mother/breastfeeding mother; I (Intervention): Oxytocin massage; C (Comparison): none; O (Outcome): Breast milk production. Evidence searching was conducted using recent journal articles published within the last five years (2020–2024), focusing on postpartum or breastfeeding mothers, studies examining oxytocin massage as an intervention to improve breast milk production, and articles available in full text. From the literature search, three articles met the inclusion criteria. Findings from these three studies indicated that oxytocin massage can contribute to increased breast milk production [8-10].

RESULTS

The Table 1 demonstrates that the continuity of care approach enabled early identification of maternal and neonatal problems across all phases of care, followed by timely and appropriate interventions. During pregnancy and labour, supportive education and non-pharmacological management contributed to stable maternal condition and physiological delivery. In the postpartum phase, the use of evidence-based oxytocin massage was associated with a marked improvement in breast-milk production, which subsequently supported neonatal weight gain. Finally, postpartum family-planning counseling ensured that the mother's reproductive health needs were addressed. Overall, these findings indicate that a continuity of care model facilitates integrated, responsive, and effective maternity services from pregnancy to family planning.

Table 1. Continuity of care interventions and outcomes across the maternity care phases

Care phase	Problems	Interventions	Outcomes
Pregnancy	Sleep deprivation, back pain, overweight, mild anemia (Hb 10.9 g/dl), Braxton Hicks contractions	Health education on sleep patterns, body mechanics, effleurage massage, iron supplementation, education on signs of labour	Problems were managed, anemia did not worsen, and the mother remained stable until delivery
Labour	Labour pain (first and second stage)	Non-pharmacological pain relief using a birth ball, position regulation, breathing and pushing technique education	Normal physiological delivery achieved. Second-degree laceration was successfully sutured
Postpartum and breastfeeding	Low breast-milk output (day 12 postpartum)	Implementation of oxytocin massage (evidence-based practice)	Breast-milk flow improved significantly from score 3 (poor flow) to score 8 (smooth flow)
Newborn	Weight loss: 3100 g at day 12 (from 3400 g at birth)	Education on exclusive breastfeeding and infant nutrition; administration of HB0, BCG, and Polio 1 immunization	Infant weight increased and stabilized (4100 g at day 32)
Family planning	Need for postpartum contraception	Family-planning counseling using the Decision-Making Tool and implant insertion	New implant acceptor; family-planning needs fulfilled

DISCUSSION

Pregnancy care

The antenatal care provided to Mrs. F met recommended standards, with a total of seven comprehensive ANC visits (one in the first trimester, three in the second trimester, and three in the third trimester), including two ultrasound examinations performed by a physician. Each visit included the implementation of the 10T antenatal service components, consisting of weight and height measurement, blood pressure assessment, mid-upper arm circumference measurement, fundal height measurement, fetal presentation and fetal heart rate assessment, tetanus toxoid immunization (the mother received two TT doses during pregnancy), iron supplementation, counseling, laboratory examinations, and case management. The number of visits exceeding the minimum six-visit standard represents an important indicator for optimal continuity of care management [10-12].

During the third trimester, Mrs. F reported discomfort including sleep deprivation and back pain, which commonly occur due to uterine enlargement and postural changes. Interventions included communication, information, and education regarding comfortable sleep positioning, proper body mechanics, and effleurage massage. Effleurage massage is known to improve blood circulation, enhance relaxation, and reduce pain, thereby directly addressing the mother's complaints [11]. Mrs. F was classified as overweight, based on a pre-pregnancy BMI of 25.3 kg/m². Maternal overweight may adversely affect both mother and fetus, including risks of diabetes and hypertension in the mother and macrosomia in the fetus. Th erefore, nutritional intake, gestational weight gain, and physical activity were closely monitored to minimize potential complications [4]. At 38 weeks of gestation, Mrs. F developed mild anemia (Hb 10.9 g/dl), whereas the WHO defines normal hemoglobin in pregnancy as ≥11 g/dl. Iron-deficiency anemia in pregnancy may result from increased iron requirements, low iron reserves, impaired absorption, inadequate dietary intake, poor dietary patterns, non-adherence to supplementation, sleep deprivation, and overweight. In this case, the contributing factors most consistent with the mother's condition were sleep deprivation and overweight.

Insufficient sleep (5–6 hours per day in this case) may increase systemic inflammatory responses characterized by elevated pro-inflammatory cytokines such as interleukin-6 (IL-6). This inflammatory process stimulates hepatic hepcidin production, which inhibits intestinal iron absorption and the release of stored iron from the liver and bone marrow. Sleep deprivation may also induce oxidative stress in bone-marrow stem cells, disrupting erythrocyte regeneration and differentiation. Furthermore, increased cortisol levels associated with sleep deprivation can suppress erythropoietin production, thereby reducing erythropoiesis. Similarly, excessive adipose tissue may produce pro-inflammatory cytokines that increase hepcidin production, further inhibiting iron absorption despite adequate intake [13-14]. Iron supplementation for mild anemia was administered at a dose of 60 mg daily, and hemoglobin monitoring was scheduled one month later in accordance with WHO recommendations [15, 16].

At 39 weeks of gestation, the mother reported abdominal tightening. Assessment indicated that this represented Braxton Hicks contractions, a normal sign of approaching labour. The mother was advised to mobilize, maintain hydration, and was informed that sexual intercourse may help stimulate uterine contractions. Braxton Hicks contractions reflect increasing uterine activity and can be relieved by changing position, resting, drinking warm fluids, and practicing relaxation. Education on early labour signs and follow-up planning was also provided [17].

Intrapartum care

First stage of labour

Labour began with regular contractions and bloody show, and the mother entered the active phase of the first stage at 4 cm cervical dilation. This phase lasted three hours, which remains within the normal duration for multigravida women (2.5–6 hours). Care during this phase focused on nutrition, hydration, mobilization (left lateral position and walking), and relaxation techniques. The main intervention was non-pharmacological

pain relief using a birth ball to facilitate labour progress. Sitting comfortably and performing pelvic movements on the ball may reduce labour pain and assist fetal head descent. This method is widely recommended in the literature because it can reduce pain, promote a positive birth experience, and accelerate cervical dilation and effacement [18-21].

Second stage of labour

The second stage lasted 20 minutes from full dilation to spontaneous birth, consistent with the theory that the second stage in multigravida women generally lasts less than 30 minutes. Effective uterine contractions and appropriate pushing techniques supported the process [21, 22]. The mother delivered in the lithotomy position, which can facilitate visualization of the perineum and controlled delivery of the fetus. This position may help reduce uncontrolled perineal tears [23].

Third stage of labour

After confirming the absence of a second fetus, active management of the third stage was performed. The mother received 10 IU intramuscular oxytocin, followed by cord clamping and cutting, and early initiation of breastfeeding with skin-to-skin contact. Controlled cord traction was then performed, and the placenta was delivered spontaneously five minutes later with complete cotyledons and membranes. Uterine massage for 15 seconds resulted in a firm contraction. Active management of the third stage aims to prevent postpartum hemorrhage and reduce blood loss by promoting effective uterine contraction and preventing uterine atony or retained placenta [24].

Fourth stage of labour

Examination revealed a second-degree perineal laceration involving the vaginal mucosa and perineal skin. After obtaining informed consent, local anesthesia with 1% lidocaine was administered and the laceration was sutured successfully with bleeding controlled. Postpartum medications included paracetamol, vitamin A, amoxicillin, and iron supplementation. Paracetamol was given for perineal pain relief. Vitamin A supplementation is traditionally used to improve maternal nutritional status and breast-milk retinol levels; however, WHO currently does not recommend routine postpartum vitamin A supplementation and instead emphasizes adequate balanced nutrition. Routine antibiotic administration after uncomplicated vaginal delivery is also not recommended due to the risk of resistance, except when infection risk is increased. Iron supplementation is recommended for at least three months postpartum to prevent anemia in breastfeeding mothers [25-29].

Postpartum and breastfeeding care

Postpartum care was implemented within a continuity of care framework, beginning at 6 hours postpartum with monitoring of uterine involution, vital signs, and lochia. All parameters were within normal limits [9, 25]. On day three, the mother was exclusively breastfeeding with adequate milk flow. However, on day 12 postpartum she reported decreased milk production, with a lactation questionnaire score of 3 indicating poor milk flow despite frequent feeding. Suboptimal milk output may be influenced by both physiological and psychological factors. Maternal overweight may be associated with reduced prolactin levels and delayed lactogenesis II, while maternal anxiety regarding infant nutrition represents a significant emotional stressor that may disrupt prolactin and oxytocin regulation and impair the let-down reflex [30].

To address this problem, oxytocin massage was implemented to stimulate oxytocin release along the vertebral column. Breast-milk production depends on prolactin secretion and oxytocin-mediated milk ejection. Sensory stimulation through massage activates neurotransmitter pathways that signal the medulla oblongata and hypothalamus, leading to oxytocin release from the posterior pituitary. Oxytocin secretion can be triggered either by infant suckling or by oxytocin massage. The massage stimulates the afferent sensory system, promoting the let-down reflex, and is recommended twice daily before breastfeeding for 3–5 minutes [31, 32]. After five days of massage, the score improved to 6, indicating smoother milk flow, and by day seven the score reached 8, reflecting substantial improvement. Thus, oxytocin massage performed twice daily effectively increased milk flow. Postpartum care concluded on day 35 with completed uterine involution. The mother chose contraceptive implant use, and insertion was scheduled after day 40 postpartum.

Neonatal care

Care for the newborn began immediately after spontaneous birth with early initiation of breastfeeding, which promotes bonding and stimulates maternal oxytocin release, supporting uterine contraction and placental expulsion. The newborn received standard care including vitamin K injection and HB0 immunization, followed by neonatal visits [21]. At the day-3 neonatal visit, the infant had no complaints and was exclusively breastfed. Vital signs and anthropometric measurements were normal. The infant was observed wearing an abdominal binder; the mother was counseled regarding its risks, including respiratory restriction, delayed cord separation due to moisture, and potential interference with organ growth. The mother was advised that warmth can be maintained using a loose swaddle instead. Danger signs were explained, and blood sampling for congenital hypothyroidism screening was performed. Thyroid hormone is essential for central nervous system development, and early detection prevents intellectual disability. A follow-up visit was scheduled at one month for BCG and polio immunization [33, 34].

At day 12, the infant had lost approximately 300 g. Weight loss within the first 10 days of life is usually up to 10% of birth weight due to meconium and urine output prior to optimal feeding. Thus, the weight loss remained within normal limits, but evaluation of maternal milk production was necessary to prevent further decline [35-36]. At one month, BCG and oral polio vaccines were administered. The infant's condition was normal, and weight gain reached 1,000 g, exceeding the minimum expected 800 g for one month. BCG immunization aims to prevent tuberculosis and is administered intradermally at a dose of 0.05 ml in the right deltoid insertion area [21].

Family planning

At 42 days, the mother reported that the puerperium had ended three days earlier and she had not resumed sexual activity. She attended the health center for contraception and, after counseling, chose a contraceptive implant. The advantages of implants include high effectiveness, long-term protection for up to five years, rapid return of fertility after removal, no need for vaginal examination, and no interference with breast-milk production [37].

CONCLUSION

The implementation of a continuity of care midwifery model from pregnancy through family planning, successfully managed all maternal and neonatal conditions. The oxytocin massage proved effective in overcoming low breast-milk production during the postpartum period. This intervention significantly improved the lactation score, supported infant weight gain, and contributed to the overall success of the maternity care process.

Ethical consideration, competing interest and source of funding

-Ethical considerations in this continuity of midwifery care practice were guided by three ethical principles. First, respect for persons, which involved providing clear information regarding the care provided, obtaining informed consent, maintaining confidentiality, and ensuring voluntary participation. Second, beneficence and non-maleficence, meaning that the care provided should offer benefits while minimizing potential discomfort or risk to the patient. Third, justice, referring to fair and equitable treatment of the patient throughout the care process.

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