**EVIDENCE BASED MIDWIFERY – AN OVERVIEW**

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**Introduction**

 Nurses and Midwives play a pivotal role in meeting public health challenges faced by health care system across the world. Their role in health promotion, disease prevention and delivering primary and community care are crucial. Nurses also provide care during emergency and are key to achieve Universal Health coverage. Health for all can be achieved based on sufficient number of well-trained educated, regulated and well-supported nurses and midwives. According to United Nations High Level Commission on Health Employment and Economic Growth investment in education and job creation in the health and social sectors result in a triple return of global health security, improved health outcomes, and economic growth. The vast development in health care industry moved to high-tech and low-touch approach. Despite the mothers in labor require personalized care to avoid unnecessary routine procedures and for the better outcome. The Global Strategic Directions for Nursing and Midwifery (SDNM) 2021-25 – four policy focus areas: education, jobs, leadership and service delivery.

* Educating enough midwives and nurses with competencies to meet population health needs
* Creating jobs, managing migration, recruiting and retaining midwives and nurses where they are most needed
* Strengthening nursing and midwifery leadership throughout health and academic systems and
* Ensuring midwives and nurses are supported, respected, protected, motivated and equipped to safely and optimally contribute in their service delivery settings

Nursing and midwifery are rooted in practice and refined with research. Nurse midwife are caring the patient round the clock and generating crucial evidences and contributing much in the field of research.

**Evidence-based practice**

Nurses use the principles of evidence-based practice to make optimal decisions about care when they integrate the best available science into their practice, they work from a holistic, patient-centered approach. It is a method by which practitioners of healthcare professions review and assess the most recent, the highest quality research to notify their delivery of care. It has three core aspects of the following,

Best external evidence is evaluating and implementing utmost current, clinically relevant and scientifically sound research. Drawing your own experience of which has worked and not worked during clinical practice. Considering and valuing the preferences of individual patients. Evidence-based practice improves patient outcomes through superior care, maximizes providers time and reduces costs and adds new contributions to the nursing. The five steps in Evidence-based practice are the following,

* Act: Formulating answerable clinical question about a problem, patient, intervention or outcome
* Acquire: Search for relevant evidence to answer questions
* Appraise: Determine whether the evidence is high quality and valuable
* Apply: Make clinical decisions utilizing the best available evidence
* Assess: Evaluate the outcome of applying the evidence to the patient’s situation

**Evidence-based midwifery**

Practice needs to be informed with evidence in health care. However, evidence arises from proper decision making which has become an expected approach to practice and policy-making in all areas. Nowadays in India, nursing students are practicing clinical learnings based on objective structured clinical or practical evaluation which makes them to understand step by step with rationale. Procedural steps and rationales are based on current available best evidences. These evidences help in identifying new solutions to the old problems. Nurses are enthusiastic in research and contributing much innovations in the field of evidence-based practice. To mention few, nurses identified that early ambulation after the surgery helps in good prognosis and reduces length of stay in the hospital and continuous virtual monitoring (CVM) to safeguard the patients from falls.

Midwifery is as old as the history of human species. The history of midwives was also seen during the period of Aristotle between 384-322 BC where he described the essential qualities of the midwife. Modern maternal and child health work was begun in India by foreign missionaries with an effort to train dais. During the time of delivery obstetric-led care overshadowed the midwifery-led care. More than 30 years ago Cochrane attributed the wooden spoon to obstetrics for being the least evidence-based medical specialty. Till today in most of the hospitals in India some unwanted interventions are in practice such as enema, forced position during labor, episiotomy, Kristeller Maneuver, mother and baby separation at birth. Midwives rationalized the importance and improvement of midwifery care models with the ample number of evidences. Researchers conducted a rigorous systematic review comparing midwifery-led models of care and concluded that it has benefit over other models of care. Midwifery led care reduces the number of cesarean sections, reduces the cost of delivery, lessens the need for pharmacological pain management during delivery. Evidence-based practice was perceived to offer a powerful tool to question and examine obstetric-led models of care that had dominated the previous decades. The results of such examination could have meant ‘starting stopping’ the unhelpful interventions that had embedded themselves in common practice (Muir Gray 1997).

Page (1996, p.192) even suggested that it offered to ‘take us out of the dark ages and into the age enlightenment’ by demanding that women were only offered care and treatments that had been evaluated. Bogdan-Lovis and Sousa (2006), observing professional conflict between an obstetric and midwifery model of care, comment on the fact that in the context of over-medicalization of childbirth, high profile evidence is usually measuring action rather than inaction, by focusing on when to intervene rather than whether to intervene at all. Beside ‘heart and hands’, good midwifery practice requires a regular update on best available evidence. Unless the evidence-based midwifery is included in the curricula the midwives might believe the routines are the best available evidence.

**Evidence-based practice in pregnancy**

Any species in the world the ultimate purpose is reproduction. Pregnancy is the period in which women’s body gets adapted to the needs of offspring and mother undergoes physical, physiological, hormonal and emotional changes which are considered quite normal however, it is unique to individual pregnant mother. Pregnant mother may undergo some deviations from normal which should to be identified and treated earlier. Primary health nurse and midwife are the person at periphery level and abnormalities can be identified by them to save the lives of both mother and baby and to reduce the morbidity ad mortality.

**Hyperemesis Gravidarum**

 Hyperemesis gravidarum (HG) a severe form of vomiting during pregnancy affecting 0.3% to 1.0% of pregnancies, and is the most common indications for hospitalization during early pregnancy (ACOG 2004). HG has both maternal and fetal complications. Although is a rare source of maternal mortality, is a significant source of morbidity. Malnutrition and vitamin deficiencies may lead to anemia and neuropathies, or more serious yet rare complications such as Wernicke’s encephalopathy and central pontine myelinolysis. Rosper C Boelig et al (2016) assessed the effectiveness and safety of all interventions for HG in pregnancy up to 20 weeks gestation. Search method included Cochrane Pregnancy and Childbirth Group’s Trails Register and Cochrane Complementary Medicine Field’s Trails Register (20 Dec 2015). Twenty-five (involved 2052 women) trails met the inclusion criteria but majority of 18 different comparisons described in the review included data from single studies with small participants. The socioeconomic costs of HG are also significant, starting from individual expenses from paying for hospitalization, lost job productivity and increased health care costs related to admissions to hospital. The study concluded that range of intervention are commonly used for the treatment included dietary and lifestyle modifications, complementary therapies such as acupuncture, herbal remedies, pharmaceutical therapies including antiemetics, corticosteroids and parenteral or enteral nutrition. These therapies reduced nausea and vomiting, decreased hospitalization, reduced symptom severity and improved quality of life. However, the values were not statistically significant to generalize the study findings.

**Gestational Diabetes Mellitus (GDM)**

Prevalence of GDM is increasing, with approximately 15% of pregnant women affected worldwide, varying by country, ethnicity and diagnostic thresholds. Systematic review by Ruth Martis et.al (2018) on comprehensive synthesis of evidence focusing benefits and harms associated with interventions for treating GDM on women and their babies’ states that lifestyle changes (including as a minimum healthy eating, physical activity and self‐monitoring of blood sugar levels) was the only intervention that showed possible health improvements for women and their babies. The review included 12 studies out of which 10 provided relevant high-quality data. The study concluded that lifestyle interventions may result in fewer babies being large. Conversely, in terms of harms, lifestyle interventions may also increase the number of inductions. Taking insulin was also associated with an increase in hypertensive disorders, when compared to oral therapy. There was very limited information on long‐term health and health services costs. Further high‐quality research is needed.

 Another meta-analysis by Russo et.al (2015) concludes that 10 randomized trials of physical activity in pregnancy (with 3,401 participants) suggests a 28% lower risk of gestational diabetes in the intervention group. Physical activity in pregnancy provides a slight protective effect against the development of GDM. The analysis was based on 55 abstracts using PRISMA (Preferred Reporting Items for Systematic- Reviews and Meta-Analysis) guidelines.

 Karaponi AM et al (2020) conducted a systematic review on probiotic treatment for women with gestational diabetes mellitus (GDM) to improve maternal and infant health and well-being. Search methods included Cochrane pregnancy and Childbirth’s Trails Register Clinical Trails.gov, WHO International Clinical Trails Registry Platform (ICTRP) (24 July 2019). Nine Randomized Controlled Trails were included (695 pregnant women with GDM) which compared probiotics versus placebo. In relation to maternal outcome the results of study found that probiotics compared with placebo, there was evidence of reduction in markers for insulin resistance (HOMA-IR) and (HOMA-B), insulin secretion and increase in quantitative insulin sensitivity check index (QUICKI). In the study the infant or child outcome were uncertain if probiotics have any effect. The study concluded that due to the variability of probiotics used and small sample sizes of trails, evidence from this review has limited ability to inform practice.

**Pregnancy Induced Hypertension (PIH)**

 Pregnancy induced Hypertension id one of the most common causes of both maternal and neonatal morbidity affecting 5-8% pregnant women. Hypertensive disorders of pregnancy can be subclassified into four groups – chronic hypertension, gestational hypertension, preeclampsia, and superimposed preeclampsia in the setting of chronic hypertension, as laid out in the ACOG (American Congress of Obstetricians and Gynecologists) guideline.

Diagnostic criteria of severe pre-eclampsia

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|  | **National Institute for clinical Excellence (2010) (any of the featured below in combination with hypertension & proteinuria)** | **American college of obstetricians & Gynaecologists (2013) (any of the below with known preeclampsia)**  | **American Society of Hypertension (2008)** |
| Symptoms | HeadacheVisual disturbanceVomitingEpigastric pain | Severe persistent right upper quadrant or epigastric painCerebral or visual disturbance  | HeadacheVisual disturbanceAbdominal pain |
| Signs | PapilloedemaClonusLiver tenderness | Pulmonary edema | OliguriaEarly onset disease (<35 weeks) Non reassuring fetal monitoring |
| Hypertension | Severe hypertension & proteinuria | Systolic BP>160 mmHg Diastolic BP >110 mmHg(on two occasions > 4 h apart while on bed rest) | Diastolic>110 mmHg |
| Other maternal disorder | HELLP syndromePlatelets<100X109/LAST or ALT>70 | Platelets<100X109/LLiver enzymes>twice normal concentrationProgressive insufficiency  | Elevated creatinine Nephrotic range proteinuriaElevated AST or LDH |

**Abbreviations:** HELLP, hemolysis, elevated liver enzymes and low platelets; AST, aspartate transaminase; ALT, alanine transaminase; LDH, lactate dehydrogenase.

Certain inadequacies are found in current diagnostic tests and newer tests are under evaluation like pregnancy-associated plasma protein A (PAPP-A), placental protein 13 (PP-13), homocysteine, asymmetric dimethylarginine (ADMA), uric acid, and leptin. However, none of these has adequate performance individually as a clinical test, but several groups have proposed models that include a number of factors in addition to maternal history and/or ultrasound markers to identify women at risk of preeclampsia. Placental growth factor (PIGF) is a proangiogenic factor, and from as early as 11–13 weeks’ gestation low levels are associated with the later development of preeclampsia, sFlt-1 (soluble fms-like tyrosine kinase 1) is antiangiogenic and levels are elevated as much as 5 weeks prior to the clinical onset of disease. Both have been evaluated as diagnostic tests but neither has sufficient sensitivity to be of use in clinical practice. Preliminary studies have evaluated the use of the sFlt-1/PIGF ratio as a diagnostic and screening test, and have found a high specificity and sensitivity, particularly for early onset disease.

**Evidence-based Practice in Labor and Delivery**

 In the 21st century, we can see a paradigm shift in the use of evidence-based practice in the field of midwifery. Evidence shows that quality midwifery care provided by midwives educated to international standards, reduces maternal and new born mortality and stillbirth rates by 83% and with 56% improved maternal and new born health outcomes.

**Labor pain management**

One of the most researched areas in midwifery is the labor pain. Most woman would like to avoid pharmacological interventions and prefer non-pharmacological methods. Acupuncture and acupressure for labor pain management is practiced in many settings. Smith Caroline et al, 2020 done a Cochrane review regarding the effects of acupuncture and acupressure for pain management in labor. The authors’ conclusion was acupuncture in comparison to sham acupuncture may increase satisfaction with pain management. And the author was uncertain about the effect of acupressure and acupuncture on the pain intensity as the evidences were poor. The author recommends high quality research in this area for strong evidence.

A Cochrane review (Smith Caroline A et al, 2018) on the evidence of the effect of relaxation therapies on pain management in labor, the quality of evidence is very low when comparing the effect of yoga, relaxation and music on labor pain, but the woman satisfaction with pain relief was increased. The authors recommended further RCT’s with clinically evident outcomes.

Smith Caroline A et al, 2018 done a Cochrane review to assess the effect, safety and acceptability of massage, reflexology and other manual methods to manage pain in labor. The findings of the study were massage, warm pack and thermal manual may have a role in reducing pain, reducing length of labour and improving women’s sense of control and emotional experience of labour, although the quality of evidence varies from low to very low. Few trials reported on safety as an outcome. The study recommended a need for further research to address the efficacy and effectiveness of these methods.

A Cochrane review (Smith Lesely A et al, 2018) was done to assess the effectiveness, safety and acceptability to women of different types, doses and modes of administration of parenteral opioid analgesia in labor. The study concluded that parenteral opioids can reduce the pain in an uncomplicated pregnancy but it is associated with drowsiness, nausea and vomiting in the woman. The effect of the drug on the new born is not clearly mentioned. The authors recommended more research to identify which analgesic intervention is most effective.

Epidural analgesia is widely accepted for pain relief during labor. A Cochrane review done by Sng Ban Leong et al, 2018 regarding the effects of automated mandatory bolus (AMB) versus basal infusion (BI) for maintain epidural analgesia in labor revealed a moderate – certainty evidence that both AMB and BI have similar outcomes.

A Cochrane review on effectiveness of epidural versus non-epidural or no analgesia for pain management done by Anim-Somuah Millicent in 2018 revealed low quality evidence on effectiveness of epidural analgesia on reducing labor pain than with non-epidural methods. The author concluded that further research may be helpful in identifying the adverse effects associated with its use.

**Induction of labor**

 Induction of labor is done to initiate labor pain artificially. There are medical, surgical and mechanical methods are available for induction. A Cochrane review to assess the effect and safety of membrane sweeping for induction of labor was done by Finucane Elaine M, 2020 revealed that it may be effective in achieving spontaneous onset of labor, but the evidence for this was of low certainty. More studies are needed regarding the optimal number of membranes sweeps and the ideal timing for membrane sweep and on which gestation sweeping can be done to facilitate induction of labor.

The Cochrane review to assess the effects of a policy of labor induction at or beyond 37 weeks’ gestation compared with a policy of awaiting spontaneous labor indefinitely on pregnancy outcomes for the infant and the mother was undertaken by Middleton Philippa, 2020. The study revealed that there is clear reduction in perinatal death, if there is a policy of labor at or beyond 37 weeks. The authors recommended more studies regarding the timing of initiating induction.

There are studies regarding the effect of settings on induction of labor. A similar Cochrane review done by Alfirevic Zarko, 2020 on the effect of neonatal and maternal outcomes of third trimester home induction of labor compared with in-patient induction using the same method of induction revealed that the effectiveness is limited and of low certainty. Large cohort studies are needed to observe the safety data associated with settings of induction.

A Cochrane review on low dose oral misoprostol for induction of labor was carried out by Kerr Robbie S in 2021. The evidence suggested that low dose oral misoprostol has outweighed the benefits over the other methods of induction. It is recommended that more trials are needed to establish the optimum dose regimen.

Water birth is widely accepted and practiced nowadays in hospitals of many countries. A Cochrane review (Cluett Elizabeth R, 2018) to assess the effects of water immersion during labor and or birth on women and their infants was done. The findings of the study shows that the in those women the need for regional analgesia is reduced, but there is no effect on mode of delivery and perineal trauma. No evidences were found regarding the increased adverse effects to the fetus and neonate.

Birth companion during labor is another area where studies are being done. Birth companion can be any one who can provide comfort to the laboring women, as partner, family member, friend or health care professional. Evidences shows that it improves outcomes for the mother and baby. But there are certain factors that can affect the successful implementation of birth companionship in the hospital setting. A Cochrane review was undertaken by Bohren Meghan A et al, 2019 to describe and explore the perceptions and experiences of women, partners, community members, health care providers and administrators regarding labor companionship. The authors’ conclusion was that ahead of implementation of labor companionship, researchers and programmers should consider the factors that may affect the implementation, including training content and timing for providers, women and companions; physical structure of the labor ward; specifying clear roles for companions and providers; integration of companions; and measuring the impact of companionship on women’s experiences of care.

Routine vaginal examinations are being done to assess the progress of labor. Frequent vaginal examinations can be uncomfortable to the woman and can result in infections. A Cochrane review was carried out by Moncrieff Gill et al, 2022 to compare the effectiveness, acceptability and consequences of routine vaginal examinations compared with other methods, or different timings, to assess labor progress at term. RCTs where comparison of vaginal examination and other methods like routine USG, routine rectal examination, 4-hrly vaginal examination with 2-hrly vaginal examination, routine vaginal examination versus vaginal examination as indicated were selected for the Cochrane review. The study findings concluded that there is low evidence on the effectiveness and acceptability of any method. Large scale RCT s are required to find out the best possible method. The authors also stated that the methods to assess the progress of labor should provide the women with a positive childbirth experience also.

**Evidence -based practice in postnatal period**

Health education and empowerment of women through education helps in improving the overall health of the family. A Cochrane review was done to compare a community health educational strategy versus no strategy for improving neonatal health and survival in low- and middle-income countries. The author Lassi Zohra S, 2019 concluded that the review offers encouraging evidence on the value of integrating packages of interventions with educational components delivered by a range of community workers in group settings, with groups consisting of mothers, and additional education for family members, for improved neonatal survival, especially early and late neonatal survival.

Length of hospital stay during the postnatal period is one of the most researched areas. A Cochrane review done by Jones Eleanor, 2021 on early postnatal discharge from hospital for healthy mothers and term infants in terms of maternal, infant and paternal outcomes revealed that the term ‘early discharge’ varied widely among the trials and also none of the trials were from low-income countries. The author recommended large well-designed studies with standardized process of outcome evaluation is needed to assess the effect of early discharge on maternal and infant outcomes.

Home visits during the postnatal period is helpful in identifying the health problems early and prevent serious issues. Cochrane review was done by Yonemoto Naohiro to assess the effects of different schedules for home visits in the early postpartum period. The review focused on the frequency of home visits (how many home visits in total), the timing (when visits started, e.g. within 48 hours of the birth), duration (when visits ended), intensity (how many visits per week), different types of home visiting interventions. The evidence is very uncertain about the effect of home visits on maternal and neonatal mortality. Individualized care as a part of a package of home visits probably improves the depression scores at four months and increasing the frequency of home visits may improve exclusive breastfeeding rates and infant healthcare utilization. Overall, the certainty of evidence was found to be low and findings were not consistent among studies and comparisons.

Urinary incontinence and fecal incontinence are the reported ailments seen in antenatal and specially postnatal mothers. Cochrane review to assess the effect of pelvic floor muscle training for preventing and treating urinary and fecal incontinence in antenatal and postnatal women was done by Woodley Stephanie J, 2020. The study concluded that there is evidence that Pelvic floor muscle training in pregnancy and postpartum period can prevent the occurrence of incontinence.

A common postpartum minor ailment is constipation. It can be presented as hard stool or pain or straining during defecation. A Cochrane review done by Turawa Eunice B et al, 2020 to evaluate the effectiveness and safety of interventions for preventing postpartum constipation revealed that the evidences about the effectiveness and safety of laxatives is very less. The authors’ recommended rigorous trials are needed to assess the safety of the laxatives used.

Venous thrombo-embolism, is one of the major causes of maternal mortality and morbidity during postnatal period. A Cochrane review to assess the effects of thromboprophylaxis during pregnancy and early postnatal period on the risk of venous thrombo-embolism and its adverse effects shown that the evidences are very uncertain about the benefits and harms of VTE prophylaxis and further high quality large scale randomized trials are needed to determine its effects (Middleton Philippa, 2021)

**Conclusion**

 Nurses and midwives play an important role in tackling public health challenges present in health systems. Quality health-care services require clinical decision making in nursing and midwifery that is based on evidence. The best available evidence should be utilized when improving aspects of quality in health care and enhancing evidence-based practice. The purpose of this chapter was to promote a shared understanding of EBP in nursing and midwifery and strengthen its foundations.

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