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EXPLORING THE RELATIONSHIP BETWEEN NURSES' USE OF EVIDENCE-BASED LABOR INTERVENTIONS AND THE DURATION OF LABOR: A CORRELATIONAL STUDY

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ABSTRACT

Background: *Evidence-based labor interventions such as continuous support, freedom of movement, spontaneous pushing, and non-pharmacological pain management have been shown to positively influence maternal outcomes. However, their consistent use in clinical practice remains variable, which may affect labor duration and overall maternal experience.*

Aim: *The study aimed to examine the relationship between nurses' use of evidence-based labor interventions and the duration of labor among primiparous women at Saidu Teaching Hospital, Swat.*

Methods: *A quantitative correlational design was employed. Data were collected retrospectively from 150 medical records of primiparous women with term, singleton pregnancies who experienced spontaneous labor and vaginal delivery without complications. Evidence-Based Practice (EBP) Scores (0–4) were assigned based on documented use of four interventions. Labor duration was measured in hours, and additional variables such as maternal age, BMI, epidural and oxytocin use, and infant birth weight were extracted. Data were analyzed using descriptive statistics, Pearson correlation, and multiple linear regression with SPSS version 28.*

Results: *The majority of participants (53.3%) had a labor duration of 6–10 hours, and 30% of nurses documented the use of two evidence-based interventions. A significant negative correlation was found between EBP Scores and labor duration ($r = -0.42$, $p < 0.001$), indicating that higher use of evidence-based practices was associated with shorter labor.*

Conclusion: *The findings highlight the positive impact of nurses' use of evidence-based labor interventions in reducing labor duration. Standardization of these practices and ongoing professional training are recommended to improve maternal outcomes.*

Keywords: *Evidence-based practice, labor duration, nursing interventions, maternal outcomes, Saidu Teaching Hospital*

INTRODUCTION

Evidence-based labor interventions are clinical practices utilized in the delivery of a child that has been proven by rigorous research. They include the upright posture, the prolonged maintenance of work, and the rational employment of oxytocin to improve (Kaplan and Cevik, 2023). Duration of

labor refers to the active and passive hours of time between the beginning of active and regular contractions up to delivery. Nurses using those evidence-based interventions affect the labor progression (CHECK, 2022).

Prevalence is a term that is used to describe the frequency at which events or practices happen in a selected population or environment. not evenly distributed evidence-based interventions applied by nurses: of the policies of institutions of higher learning, and staffing institutions, they are referring to continuous labor assistance by nurses as 40-60 percent of births in high-income countries (Hodgins and O'Connor, 2021). Mother and neonatal complications are linked to more than 12 hours of labour (Dalbye et al., 2021).

One of the nurse-initiated interventions that have been demonstrated to reduce the active phase to a maximum of two hours is upright positioning during labor (Nguyen, 2023). It is also claimed that hydrotherapy helps relieve pain and faster birth of a baby (Mohamed et al., 2025). Adding oxytocin using the interventions can prolong the labor or predispose to a cesarean when incorrectly applied or misused (Niemczyk et al., 2022). Workload, staffing, training, and institutional policies supporting standardized and supine positioning are recognized as barriers to the implementation of evidence-based labor interventions by nurses (Buckingham, 2025).

There is very little research on the relationship between evidence-based labor practices and the actual labor duration of nurses. There are observational studies that suggest midwives or lactation consultants who use continuous support reduce the duration of labor by 90 minutes on average (DeCoste, 2024). The environments in which nurses use upright positioning regularly and in which they report less frequent cases of long labor over 18 hours (Abdel-Sammad, 2022). Facilities with comprehensive nurse training in evidence-based labor care report reductions in active labor duration by 20% (Portela Dos Santos et al., 2022).

Efficiency-focused versus individualized care culture within an organization reduces nurse autonomy in supporting interventions (Thomaides-Brears et al., 2022). Interventional studies also showed that active encouragement to promote labor by nurses after some training reduced labor and maternal satisfaction (Abdel-Sammad, 2022). The survey data show that upright positioning is not always used by labor and delivery nurses despite the guidelines (Zhou et al., 2021).

Knowledge of the correlation between the application of evidence-based labor interventions by nurses and labor duration may aid education and policy. Consistency by nurses is closely associated with less labor time when an institution supports them (Mohamed et al., 2025). The quantitative measurement allows determining the direction and the magnitude of the association between variables without manipulation (Dalbye et al., 2021). Information obtained through correlational studies can inform personnel education and protocol modifications.

The correlational research design is appropriate to this question, as it will be possible to quantify relationships between level of nurse practice of evidence-based interventions (measured through observation or self-report) and labor outcomes duration. The quantitative measure allows one to identify the strength and direction of a relationship between variables without any manipulation (Dalbye et al., 2021). Results can be used to promote specific measures to enhance labor outcomes.

Methodology

A quantitative, correlational study design was employed to explore the relationship between nurses' use of evidence-based practices and labor duration. The study was conducted at the labor and delivery unit of Saidu Teaching Hospital in Swat. The sample size was calculated using the OpenEpi online toolkit. Based on an anticipated correlation coefficient and standard power parameters, a minimum sample of 123 was determined; this was increased to 150 to account for incomplete records. The final sample consisted of 150 electronic medical records of primiparous women with term, singleton pregnancies who experienced spontaneous labor and delivered vaginally without major complications.

Data Collection

Data were collected retrospectively using a standardized extraction tool. The key independent variable was a composite "Evidence-Based Practice (EBP) Score" (0-4), derived from the documented use of four interventions: continuous labor support, freedom of movement, spontaneous pushing, and non-pharmacological pain management. The primary dependent variable was

the total duration of active labor, measured in minutes from admission at ≥4 cm dilation until delivery. Control variables collected to mitigate confounding included maternal age, BMI, epidural use, oxytocin administration, and infant birth weight. A random 10% of records were re-reviewed to ensure inter-rater reliability, which was confirmed with a Cohen's kappa score >0.8.

Data Analysis

Data were analyzed using SPSS version 28. Descriptive statistics summarized the sample. A Pearson correlation analysis examined the relationship between the EBP Score and labor duration. A multiple linear regression was then conducted to determine if the EBP Score was a significant predictor of labor duration after controlling for confounding variables. A p-value of <0.05 was considered significant. Ethical approval was granted by the hospital's Institutional Review Board. All data were anonymized and stored securely to protect patient confidentiality in this retrospective records review.

Results and Analysis

The analysis shows that the majority of mothers (44.7%) were aged 25–30 years, with a smaller proportion above 35 years (8.7%). Most participants were either overweight (42.7%) or normal weight (37.3%), while 20% were obese. Epidural use was reported in 31.3% of cases, whereas oxytocin was administered to 39.3% of mothers. Infant birth weight was most commonly between 3000–3499 g (50.7%), followed by <3000 g (27.3%). Overall, the findings suggest that maternal age, BMI, and intervention use varied, with average birth weights reflecting favorable neonatal outcomes. [Table 1].

Table 1. Demographic and Clinical Characteristics of Participants (n = 150)

Variable	Categories	Frequency (n)	Percentage (%)
Maternal Age (years)	18–24	38	25.3
	25–30	67	44.7
	31–35	32	21.3
	>35	13	8.7
BMI (kg/m²)	<25 (Normal)	56	37.3
	25–29.9 (Overweight)	64	42.7
	≥30 (Obese)	30	20.0
Epidural Use	Yes	47	31.3
	No	103	68.7
Oxytocin Use	Yes	59	39.3
	No	91	60.7
Infant Birth Weight	<3000 g	41	27.3
	3000–3499 g	76	50.7
	≥3500 g	33	22.0

The findings showed that most nurses scored in the mid-range of EBP use, with 30.0% utilizing two interventions and 25.3% using one. Only 10.0% applied all four interventions consistently, while 14.0% reported no use of EBP strategies. Moderate application was more common than full compliance, reflecting partial integration of evidence-based practices. These results highlight gaps in the comprehensive adoption of EBP in labor management. [Figure 1]

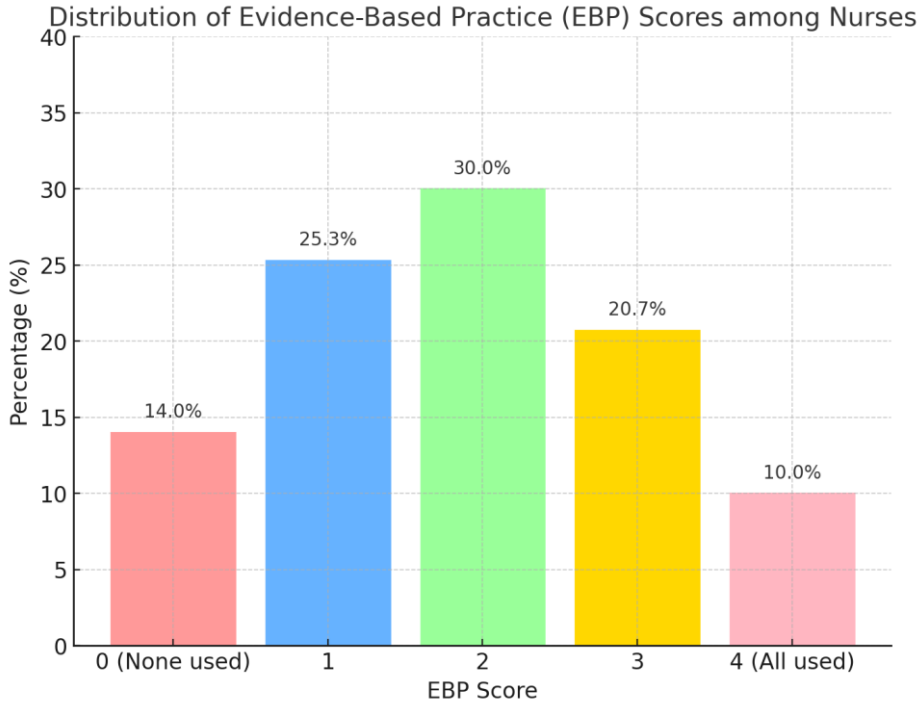

Figure 1. Distribution of Evidence-Based Practice (EBP) Scores (n = 150)

The majority of labors (53.3%) lasted between 6 to 10 hours. Smaller proportions of women experienced labors shorter than 6 hours (18.7%) or longer than 15 hours (6.7%). The distribution shows that most labors in this study population fell within a moderate duration range. [Figure 2].

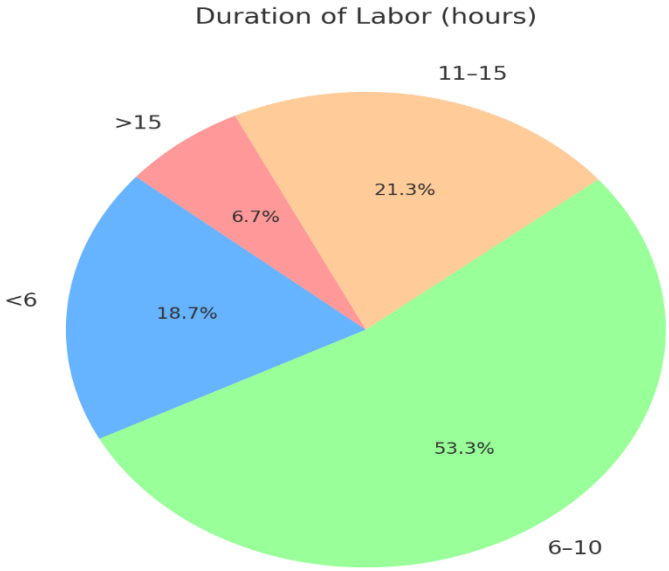

Figure 2. Duration of Labor Among Participants (n = 150)

The Pearson correlation revealed a statistically significant negative relationship between nurses' use of evidence-based labor interventions (EBP Score) and the duration of labor ($r = -0.42$, $p < 0.001$). This indicates that higher use of EBP interventions was associated with shorter labor duration. [Table 2].

Table 2. Pearson Correlation Between EBP Score and Duration of Labor

Variable	Duration of Labor (hours)
EBP Score	**r = -0.42**, p < 0.001

Discussion

The results of this research indicated a strong negative relationship between application of evidence-based labor interventions and length of labor by nurses, that is, the greater the application of an intervention like continuous support, freedom of movement, spontaneous pushing and non-pharmacological pain management, the shorter the labor. The study highlights the practicability of evidence-based practice towards enhancing maternal outcomes. Similar results were suggested by Abdel-Sammad (2022), who found that structured preceptorship and orientation of maternity nurses resulted in better results as they led to a decrease in complications during the third stage of child delivery. Similarly, Nguyen (2023) demonstrated that educating nurses on the birthing positions made the descent of a fetus possible and maximized the efficiency of the labor process. These results support the role of evidence-based interventions, especially those led by nurses, in the labor process.

However, this is not the case, as there are studies that reported inconsistent impacts of evidence-based interventions on labor duration. Evidence-wise, Portela dos Santos et al. (2022) found that even after the educational interventions, which enhanced knowledge and skills acquisition, the translation of the results into the routine practice was inconsistent and dampened the potential quantifiable effect of the interventions on clinical outcomes. Similar findings were reported by Sapri et al. (2022), who found that compliance with evidence-based protocols in clinical practice usually varied during systematic training. This is in contrast to the present study whereby, the high usage of interventions led to a significant reduction in labor-time, and, by extension, it must be noted that institutional reinforcement and the context within which it is practiced is a crucial ingredient in achieving gains.

Another point highlighted in the current research is that evidence-based interventions led to an increase in efficiency at the time of labor without interfering with the safety of the mother. Similar conclusions were made by Meng et al. (2022), who found that evidence-based nursing interventions yielded a low post partum anxiety level and a higher maternal well-being with a more extensive range of psychosocial rather than efficiency benefits. However, unlike post partum care, dynamic decisions, particularly in labor care, and greater reliance on clinical judgment are required. The gap indicates that evidence-based practices could be applicable in general, but at a different pace, in other maternal care settings.

The findings also indicate the importance of the knowledge and practice of nurses in influencing maternal outcomes. Similar to the focus in the present study on the impact of practice adoption, McKune (2021) discovered that perinatal nurses attributed their use of evidence-based practices to their attitudes toward them, which in turn had a significant impact on the research results. At the same time, McLaughlin (2024) emphasized that self-care education outcomes depend on cultural factors and that individual and systemic barriers beyond knowledge may mediate the effects of interventions. This follows the notion that structural reinforcement, institutional support and contextual sensitivity are fundamental to routine evidence-based practice.

These findings add to the accumulating body of evidence that structured and nurse-led protocols can improve clinical practice variability. The current results were supported by Al Maqbali (2024) who clarified that quantitative nursing studies always show better results when protocols are used systematically. Likewise, DeCoste (2024) identified that roles that were designed to address lactation consultant mental health included standardized roles, which increased the standard of care and improved results, as was found in other areas of standardized, nurse-based intervention. But, unlike lactation support, labor care requires fast adjustment to the situation of each patient, which complicates its standardization.

These results also demonstrate that educational interventions play an important role in enhancing adherence to evidence-based practice. As Buckingham (2025) argues, the years-long and sustained practice improvement experience produced by breastfeeding medicine specialty training confirmed the importance of clinical

development through formal training. At the same time, Sapri et al. (2022) have added that structured educational interventions can be effective in improving clinical adherence to evidence-based nursing practices, which is in line with the present findings that systematic support and training can be effective in improving efficiency in labor care.

Altogether, the current research paper demonstrates that evidence-based labor interventions can be used to decrease the time of labor and enhance outcomes in mothers. The results are consistent with McLaughlin (2024) who demonstrated that culturally-sensitive evidence-based nursing interventions influence health outcomes positively, or the overall usefulness of evidence-based practice. At the same time, the findings complement those of Portela Dos Santos et al. (2022) who underscored that the success of this kind of intervention is determined by institutional and cultural support that must be long-term. Combined, these findings support that evidence-based practices improve maternal outcomes; however, effective implementation needs training, compliance, and situational support at the systems level.

Conclusion

This study demonstrated a significant negative relationship between nurses' use of evidence-based labor interventions and the duration of labor, indicating that consistent application of practices such as continuous support, freedom of movement, spontaneous pushing, and non-pharmacological pain management contributes to more efficient labor outcomes. These findings highlight the critical role of nurses in implementing evidence-based practices to optimize maternal care. The results further emphasize that institutional support, structured training, and adherence to standardized protocols are essential in ensuring consistent and effective practice. While this study confirms the benefits of evidence-based interventions, it also underlines the need to address systemic barriers such as workload, resource limitations, and variations in knowledge to maximize their impact.

Recommendations

1. **For Nursing Education**: Incorporate structured training on evidence-based labor interventions into nursing curricula, with emphasis on simulation and hands-on practice to strengthen skills and confidence.
2. **For Clinical Practice**: Standardize the use of nurse-driven, evidence-based labor protocols across labor and delivery units to reduce variability and improve patient outcomes.
3. **For Professional Development**: Provide regular in-service workshops, refresher training, and mentorship programs to enhance nurses' knowledge and sustain compliance with best practices.
4. **For Policy and Administration**: Develop institutional policies that support workload management, ensure adequate staffing, and monitor adherence to evidence-based labor protocols.
5. **For Future Research**: Conduct longitudinal and multi-center studies to explore the long-term effects of evidence-based labor interventions on maternal and neonatal outcomes, and to identify strategies for overcoming barriers to implementation.

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