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PERINATAL OUTCOME IN WOMEN PRESENTING WITH DECREASED FETAL MOVEMENTS

Original Research

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ABSTRACT

Background: Reduced fetal movements (DFM) during pregnancy are often indicative of compromised fetal well-being and have been associated with increased risks of adverse perinatal outcomes. Maternal perception of fetal movement remains a critical, non-invasive tool for detecting early signs of fetal distress. In low-resource settings, where access to advanced monitoring may be limited, timely recognition and management of DFM can significantly impact neonatal health outcomes.

Objective: To evaluate the perinatal outcomes in women presenting with reduced fetal movements during the third trimester of pregnancy.

Methods: This descriptive cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Saidu Group of Teaching Hospitals, Swat, from May 9, 2024, to November 9, 2024. A total of 124 pregnant women aged between 18 and 40 years, with singleton pregnancies and gestational age above 34 weeks, who reported decreased fetal movements, were enrolled through non-probability consecutive sampling. Women with known congenital anomalies or pre-existing medical conditions were excluded. Data were collected on maternal demographics and fetal outcomes, including small for gestational age (SGA), Apgar scores at five minutes, and neonatal intensive care unit (NICU) admissions. Data were analyzed using SPSS version 24.

Results: The mean maternal age was 28.15 ± 6.57 years, and the mean gestational age was 38.48 ± 1.68 weeks. Among the neonates, 12.1% (n=15) were small for gestational age, 21.8% (n=27) had low Apgar scores (<7 at five minutes), and 27.4% (n=34) required NICU admission.

Conclusion: The findings highlight that reduced fetal movements are significantly associated with adverse perinatal outcomes. Vigilant monitoring and timely obstetric intervention in such pregnancies can improve neonatal prognosis and reduce complications.

Keywords: Apgar Score, Fetal Movement, NICU Admission, Perinatal Outcomes, Pregnancy Trimester, Reduced Fetal Movements, Small for Gestational Age.

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INTRODUCTION

Fetal movement (FM) monitoring during pregnancy offers an accessible and non-invasive method for expectant mothers to assess fetal well-being independently, without the need for clinical tools or professional assistance. Typically, women begin to perceive fetal movements between the 16th and 20th weeks of gestation (1,2). These movements increase in frequency until approximately the 32nd week, after which they tend to plateau and remain consistent until delivery. Healthcare professionals often emphasize the importance of fetal awareness, encouraging mothers to remain attentive to their baby's activity patterns (3). Some may be advised to count fetal kicks within a specific time frame, which can help detect deviations from the expected movement patterns. A decline in fetal movement is often distressing for both the mother and the attending physician, as it may be an early warning sign of fetal compromise requiring urgent evaluation (4). Observational studies have linked decreased fetal movement (DFM) with a range of adverse outcomes, including fetomaternal hemorrhage, neurodevelopmental impairments—particularly in neonates who do not respond to therapeutic hypothermia—and structural anomalies such as congenital neuromuscular disorders (5,6). These associations support the possibility of a causal pathway, whereby fetal hypoxia or nutritional deficiencies trigger an adaptive reduction in activity as an energy-conserving response (7). If the underlying stressor persists, this may culminate in a complete cessation of fetal movement, with potentially grave outcomes.
Clinical evidence has also reinforced the correlation between DFM and unfavorable perinatal results. One study reported a 9.7% incidence of small-for-gestational-age neonates and an 8.8% NICU admission rate in pregnancies affected by DFM (8,9). Another documented a 28% NICU admission rate and an 18% prevalence of low Apgar scores among similar cases (10). Despite these findings, large-scale studies specifically addressing DFM-related perinatal outcomes remain limited, especially within low- and middle-income countries like Pakistan. This represents a significant research gap, given that timely identification and management of DFM can be pivotal in preventing adverse fetal events. In light of the limited literature and the serious implications of unaddressed DFM, this study aims to determine the frequency of adverse perinatal outcomes among women presenting with decreased fetal movements, with the broader objective of informing early intervention strategies and improving maternal-fetal health outcomes.

METHODS

This descriptive study was conducted in the Department of Obstetrics and Gynaecology at Saidu Group of Teaching Hospitals, Swat, from 9th May 2024 to 9th November 2024. The study aimed to assess the frequency of adverse perinatal outcomes among women presenting with decreased fetal movements (DFM). A total of 124 participants were enrolled based on a calculated sample size, which was derived using an anticipated NICU admission rate of 8.8% among women with DFM (9), with a 95% confidence level and a 5% margin of error. A non-probability consecutive sampling technique was utilized for participant recruitment. Women aged 18 to 40 years with singleton pregnancies exceeding 34 weeks of gestation, confirmed through ultrasound based on the last menstrual period, were considered eligible regardless of parity (11). All included women presented with complaints of decreased fetal movements, defined as fewer than 10 fetal movements within a two-hour period, as assessed through maternal perception using a kick count chart. Women were excluded if antenatal ultrasound had revealed fetal congenital anomalies or if they had pre-existing medical conditions such as hypertension, diabetes mellitus, thyroid dysfunction, or other chronic illnesses that could confound perinatal outcomes (12).
Upon enrollment, baseline demographic data—such as maternal age, gestational age, parity, educational status, residence, occupation, and socioeconomic status—were recorded using a structured and prevalidated proforma. Participants were followed until delivery, during which fetal and neonatal outcomes were monitored. The primary outcomes included the incidence of small-for-gestational-age (SGA) neonates, low Apgar scores at five minutes, and admissions to the neonatal intensive care unit (NICU). All data were collected by the principal investigator to ensure procedural consistency and minimize bias. Data were analyzed using SPSS version 24. Continuous variables like maternal age and gestational age were expressed as mean ± standard deviation. Categorical variables such as residence, education, socioeconomic status, and perinatal outcomes were presented as frequencies and percentages. The Chi-square test was employed to evaluate the association between perinatal outcomes and demographic or clinical variables. Statistical significance was defined as a p-value less than 0.05. Ethical approval for the study was granted by the Institutional Review Board of Saidu Medical College and Teaching Hospital, Swat. Written informed consent was obtained from each participant prior to data collection, ensuring ethical adherence to the principles outlined in the Declaration of Helsinki.

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RESULTS

The study included a total of 124 women with a mean age of 28.15 ± 6.57 years and an average gestational age of 38.48 ± 1.68 weeks. The mean parity among the participants was 2.56 ± 0.97. In terms of residential distribution, 57.3% (n=71) of the women resided in rural areas, while 42.7% (n=53) lived in urban settings. A majority of participants were illiterate (60.5%, n=75), whereas 39.5% (n=49) were literate. Regarding socioeconomic status, 25.8% (n=32) of the participants were categorized as poor with a household income below 50,000 PKR per month, 57.3% (n=71) belonged to the middle-income group earning between 50,000 and 80,000 PKR, and 16.9% (n=21) were from the upper-income bracket earning above 80,000 PKR per month. Occupationally, 71.0% (n=88) were unemployed and 29.0% (n=36) were employed. In evaluating adverse perinatal outcomes, 12.1% (n=15) of the neonates were classified as small for gestational age, while 21.8% (n=27) had low Apgar scores at five minutes. A total of 27.4% (n=34) of the neonates required admission to the neonatal intensive care unit (NICU).

Stratified analysis showed that among the neonates who were small for gestational age, 73.3% (n=11) were born to mothers aged between 18 and 30 years, and 26.7% (n=4) to those aged 31–40 years. However, the association between maternal age and SGA was not statistically significant (p=0.30). Similarly, no significant associations were found between maternal age and low Apgar scores (p=0.80) or NICU admissions (p=0.34). Regarding gestational age, 53.3% (n=8) of SGA cases occurred in women with gestational age between 35 to 38 weeks, while 46.7% (n=7) occurred in those beyond 38 weeks, with no significant difference (p=0.90). Likewise, low Apgar scores (p=0.72) and NICU admissions (p=0.79) also showed no statistically significant associations with gestational age. Analysis of parity showed that 40.0% (n=6) of SGA neonates were delivered by women with parity of 1–2, and 60.0% (n=9) by those with parity >2 (p=0.57). For low Apgar scores, 55.6% (n=15) of the affected neonates were born to women with lower parity, while 44.4% (n=12) were associated with higher parity (p=0.30). NICU admission rates were evenly distributed across parity groups, with 50.0% (n=17) in each category (p=0.65).

Further stratified analysis based on maternal education, socioeconomic status, and employment status revealed additional insights into the distribution of adverse perinatal outcomes. Among literate women, 10.2% of neonates were small for gestational age (SGA), while 22.4% had low Apgar scores and 24.5% required NICU admission. In contrast, among illiterate mothers, the frequencies were slightly higher for SGA at 13.3% and NICU admissions at 29.3%, with comparable rates for low Apgar scores (21.3%). These findings suggest a modest influence of maternal literacy on perinatal health. Socioeconomic status showed more pronounced variation. The prevalence of SGA was highest among women from the poor-income group (18.8%), compared to 8.5% in the middle-income group and 14.3% in the upper-income group. Similarly, NICU admission rates were also highest in the poor-income subgroup (31.2%), followed by upper-income (28.6%) and middle-income (25.4%) categories. Low Apgar scores occurred in 25.0% of neonates in the poor group, compared to 19.7% and 23.8% in the middle and upper groups, respectively, indicating a possible socioeconomic gradient in neonatal outcomes. In terms of occupational status, 11.1% of neonates born to employed mothers were SGA, compared to 12.5% in unemployed women. NICU admission and low Apgar scores were also slightly more frequent among the unemployed subgroup (29.5% and 22.7%, respectively) versus their employed counterparts (22.2% and 19.4%). While differences in outcomes across employment status were less marked, the patterns reflect underlying disparities in maternal health access and support systems.

Table 1: Demographic profile of the patients

Demographic profile		Frequency	Percentage
Residence	Urban	53	42.7%
	Rural	71	57.3%
Education	Literate	49	39.5%
	Illiterate	75	60.5%
Socioeconomic status	Poor (< 50k PKR/Month)	32	25.8%
	Middle (50K to 80K PKR/Month)	71	57.3%

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Demographic profile		Frequency	Percentage
	Upper class (> 80K PKR/Month)	21	16.9%
Professional status	Employed	36	29.0%
	Unemployed	88	71.0%

Table 2: Adverse perinatal outcomes

Adverse perinatal outcomes		Frequency	Percentage
Small for gestational age	Yes	15	12.1%
	No	109	87.9%
Low APGAR score	Yes	27	21.8%
	No	97	78.2%
NICU admission	Yes	34	27.4%
	No	90	72.6%

Table 3: Association of adverse perinatal outcomes with age

Adverse perinatal outcomes		Age distribution (Years)				P value
		18 to 30		31 to 40		
		N	%	N	%	
Small for gestational age	Yes	11	73.3%	4	26.7%	0.30
	No	65	59.6%	44	40.4%	
Low APGAR score	Yes	16	59.3%	11	40.7%	0.80
	No	60	61.9%	37	38.1%	
NICU admission	Yes	18	52.9%	16	47.1%	0.34
	No	58	64.4%	32	35.6%	

Table 4: Association of adverse perinatal outcomes with gestational age

Adverse perinatal outcomes		Gestational age (Weeks)				P value
		35 to 38		> 38		
		N	%	N	%	
Small for gestational age	Yes	8	53.3%	7	46.7%	0.90
	No	60	55.0%	49	45.0%	
Low APGAR score	Yes	14	51.9%	13	48.1%	0.72
	No	54	55.7%	43	44.3%	
NICU admission	Yes	18	52.9%	16	47.1%	0.79
	No	50	55.6%	40	44.4%	

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Table 5: Association of adverse perinatal outcomes with parity

Adverse perinatal outcomes		Parity				P value
		1 to 2		> 2		
		N	%	N	%	
Small for gestational age	Yes	6	40.0%	9	60.0%	0.57
	No	52	47.7%	57	52.3%	
Low APGAR score	Yes	15	55.6%	12	44.4%	0.30
	No	43	44.3%	54	55.7%	
NICU admission	Yes	17	50.0%	17	50.0%	0.65
	No	41	45.6%	49	54.4%	

Table 6: Adverse Perinatal Outcomes by Demographic Variables

Demographic Variable	Subgroup	Small for Gestational Age (n/%)	Low APGAR Score (n/%)	NICU Admission (n/%)
Education	Literate	5/49 (10.2%)	11/49 (22.4%)	12/49 (24.5%)
Education	Illiterate	10/75 (13.3%)	16/75 (21.3%)	22/75 (29.3%)
Socioeconomic Status	Poor	6/32 (18.8%)	8/32 (25.0%)	10/32 (31.2%)
Socioeconomic Status	Middle	6/71 (8.5%)	14/71 (19.7%)	18/71 (25.4%)
Socioeconomic Status	Upper	3/21 (14.3%)	5/21 (23.8%)	6/21 (28.6%)
Employment Status	Employed	4/36 (11.1%)	7/36 (19.4%)	8/36 (22.2%)
Employment Status	Unemployed	11/88 (12.5%)	20/88 (22.7%)	26/88 (29.5%)

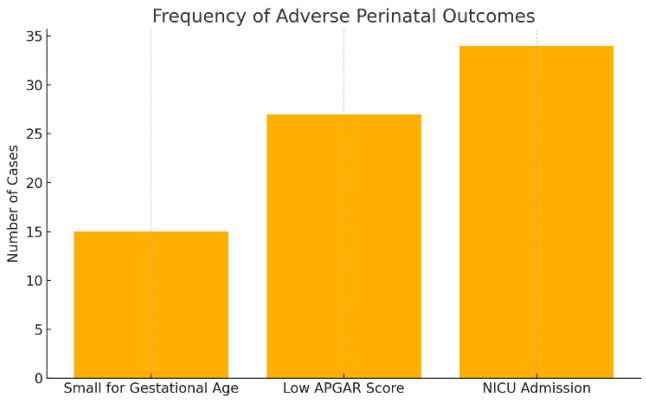

Figure 2 Frequency of Adverse Perinatal Outcomes

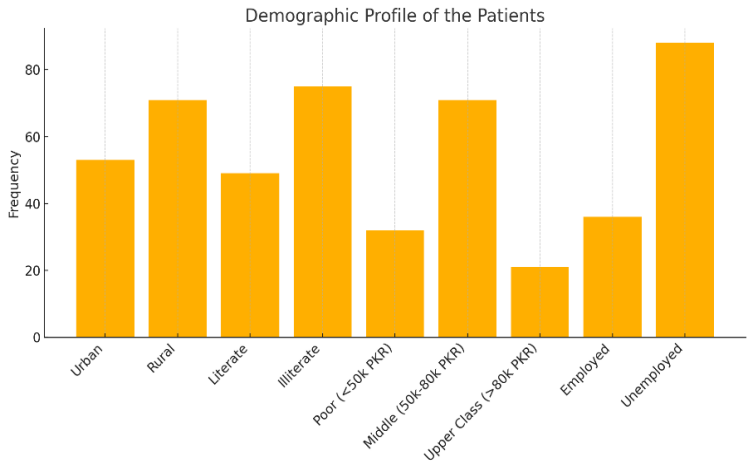

Figure 1 Demographic Profile of the Patients

DISCUSSION

In this study, the mean gestational age of 38.48 ± 1.68 weeks closely aligned with the typical term pregnancy range of 37 to 42 weeks, reinforcing the focus of reduced fetal movement (RFM) assessments in late gestation. Similar gestational age ranges have been documented in other studies conducted in Pakistan, further validating the temporal framework within which concerns about fetal activity are commonly raised (13). Maternal age in the present cohort averaged 28.15 ± 6.57 years, with most participants falling between 21 and 35 years, a demographic also mirrored in international data, where younger maternal age groups were more frequently observed to report RFM (14). This demographic representation underscores the need for increased awareness and counseling for younger expectant

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INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

mothers regarding fetal movement monitoring. A significant proportion of the study population comprised women who were illiterate (60.5%) and from low to middle socioeconomic backgrounds (15,16). These findings are crucial, as such factors are often associated with diminished access to timely prenatal care, lower health literacy, and underutilization of fetal monitoring practices. Consequently, delayed recognition or inadequate response to DFM may lead to missed opportunities for timely intervention. The implications of social determinants of health in the context of fetal well-being highlight the pressing need for community-level education and the integration of maternal health outreach services, particularly in underserved areas (17).

Adverse perinatal outcomes were evident in this cohort, with 12.1% of newborns classified as small for gestational age and 27.4% requiring NICU admission. These results corroborate existing evidence which associates DFM with a heightened risk of growth restriction and neonatal complications (18). Furthermore, the occurrence of low Apgar scores in 21.8% of the neonates adds to the growing body of literature linking DFM with compromised neonatal vitality (19). Notably, while the observed associations between maternal age and adverse outcomes such as SGA and NICU admissions did not reach statistical significance, a higher frequency of these outcomes was noted in the younger age bracket of 18 to 30 years. Similar trends have been reported elsewhere, supporting the notion that younger maternal age may pose additional perinatal risks in the context of DFM (20). An additional strength of this study was the stratified analysis of outcomes across key sociodemographic indicators. The observed trends, such as higher NICU admissions and low Apgar scores among the poor-income and unemployed subgroups, emphasize the compounded vulnerability of socially disadvantaged women. This multidimensional lens enhances the applicability of findings in shaping maternal health policies and intervention frameworks.

Nevertheless, the study is not without limitations. The modest sample size restricts the statistical power required to detect subtler associations and limits the generalizability of the findings. Moreover, the reliance on maternal perception for identifying decreased fetal movements introduces a degree of subjectivity, despite the effort to standardize it through a defined threshold. The absence of biochemical or Doppler-based fetal assessments further constrains the scope of clinical correlation. Additionally, other potentially confounding variables such as maternal body mass index, smoking status, and antenatal visit frequency were not analyzed, which may influence both the perception of fetal movement and the observed outcomes. Despite these limitations, the study contributes meaningfully to the understanding of DFM and its implications in a resource-limited setting. It reinforces the role of fetal movement awareness as a non-invasive, cost-effective tool for detecting early signs of fetal compromise (21). The findings underscore the importance of timely maternal education, robust antenatal surveillance, and structured protocols for evaluating and managing DFM. Future research should aim to incorporate larger, multi-center cohorts with more diverse clinical and biometric parameters to refine risk stratification and establish evidence-based guidelines tailored to varying healthcare contexts.

CONCLUSION

This study concludes that pregnancies complicated by reduced fetal movements are associated with a higher likelihood of adverse perinatal outcomes, including growth restriction, compromised neonatal condition at birth, and the need for intensive care. These findings underscore the clinical importance of early recognition and vigilant monitoring of fetal activity as a vital component of antenatal care. Prompt evaluation and timely intervention in response to maternal reports of decreased fetal movement can play a critical role in safeguarding neonatal health and preventing avoidable complications.

Author Contribution

Author	Contribution
Zeeba Afzal*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Parveen	Substantial Contribution to study design, interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

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