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PREVALENCE AND ASSOCITATED FACTORS OF LOW BIRTH WEIGHT AMONG MOTHERS AGED OVER 35 YEARS AT SHAHRARA HOSPITAL

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Abstract

Background: Birth weight is one of the most important indicators of neonatal health at the time of delivery, as it reflects both intrauterine fetal growth and the quality of prenatal care. Newborns with birth weights either above or below the normal range are at increased risk of mortality, physical injury, and neurological damage. As its known, one of the most critical health indicators in any society is the infant mortality rate, in which one of its key contributing factors is low birth weight (LBW). This study aims to determine the prevalence of LBW among mothers (above 35 years) highlight this important health indicator and identify one of its major contributing factors- advanced maternal age (above 35 years).

Methods: This analytic cross-sectional study was conducted on 472 women older the 35 years and 384 newborns delivered in the year 2024, at Shahrara Teaching Maternity Hospital to determine the prevalence of LBW among mothers over the age of 35 years old. Data were collected by reviewing patients' medical records, which included maternal age ,newborn birth weight, gestational age, and number of parities. For determining correlation of maternal age, number of parities and gestational age to child birth weight spearman correlation test was applied and linear regression determined the impact of related factors on child birth weight.

Results: The study found that the prevalence of LBW among mothers over 35 years of age in this hospital was 81.35% as there were totally 472 mothers older than 35 years in 2024, among them 384 were recorded with LBW. Factors such as maternal age, number of parities were negatively associated with LBW while gestational age has positive association with LBW, although effect of gestational age and number of parity is not as considerable as mothers age.

Conclusion: This study demonstrated that the prevalence of low birth weight among mothers over 35 years of age at Shahrara Teaching Maternity Hospital is concerning. Therefore ,enhancing prenatal care and preventing risk factors in this age group may help reduce the prevalence of LBW.

Keywords: Shahrara hospital, Low birth weight and Maternal age

Introduction

Low birth weight (LBW) is recognized as one of the core indicators for the Global Nutrition Monitoring Framework and is also listed among the World Health Organization's (WHO) as key health indicators. The WHO defines LBW as a birth weight of less than 2,500 grams (5.5 pounds). [1,2] LBW is a major global public health concern due to its severe health implications. It is not only a leading cause of perinatal mortality and morbidity, but studies have also shown that LBW increases the risk of developing non-communicable diseases such as diabetes and cardiovascular conditions later in life. [2, 3]

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According to WHO estimates, 15–20% of all births globally result in LBW, representing over 20 million births annually. The prevalence of LBW varies significantly between developed and developing countries. Approximately 96% of LBW infants are born in developing nations, with the highest rates reported in Asia (72.5%) and Africa (22%). As such, LBW remains a significant public health problem in low- and middle-income countries and is responsible for 40% to 60% of all neonatal deaths worldwide. [4] In South Asia, the LBW prevalence is around 28%, while in East Asia and the Pacific, it is about 6%, and in Latin America, it reaches 38%. In contrast, the prevalence in developed countries is estimated at around 7%. [5, 6] In neighboring countries, LBW prevalence is 15% in Pakistan and 37% in India, while the rate in Afghanistan (81,3) remains a critical concern. [7] therefore LBW is common health issue in developing countries. [8] Which causes 40-to-60%-word wide mortality and morbidity of newborns. One in seven is born as LBW globally. WHO and UNICEF (United Nations Children's Fund) estimates indicate that in 2020, approximately 19.8 million newborns worldwide- equivalent to 14.7% of all live births- were born with LBW. [8, 9]. In 2012, all 195 WHO member states committed to reduce the global incidence of LBW by 30% by the year 2025, compared to 2012 levels. [8, 9] LBW is also identified as a key contributor to childhood and neonatal disorders, particularly neurological issues such as developmental delays and intellectual disabilities. [11] Numerous maternal and fetal factors contribute to LBW. The newborn's weight is directly influenced by the overall health status of the mother, making maternal health one of the most significant determinants of birth weight [12]

According to the Ministry of Public Health of Afghanistan, approximately 1.1 million babies are born annually in the country, with a mortality rate of 49.6 per 1000 prenatally or postnatally Prematurity, LBW, birth complications, and infectious diseases are identified as the leading causes of neonatal mortality. [10] Although maternal and child health services have expanded significantly, prenatal care continues to face challenges that cover both mothers and infants at risk.

Shahrara Teaching Maternity Hospital is one of the key health centers in the country that offers a range of maternal health services. Given the significance of the issue, examining the prevalence of LBW among mothers aged over 35 years old in this hospital can provide valuable insights for improving healthcare services and developing

appropriate strategies for LBW prevention. This study aims to determine the prevalence of LBW among mothers over 35 years old- attending Shahrara Hospital in the year 2024, and to identify the factors associated with it. The findings of this research can support the enhancement of maternal care and guide effective strategies for LBW prevention in this age group.

Materials and Methods

This is an analytic cross-sectional study in 2024 at Shahrara Maternity Teaching Hospital. The aim was to examine the prevalence of LBW (<2500 grams) among mothers over 35 years and associated factors. There were 472 mothers older than 35 years from total births (1181) over one year, among them 384 were recorded with low-birth-weight child.

Data were collected by reviewing patient records, including maternal age, birth weight, gestational age, and number of parities. Data were analyzed by using SPSS Version 24. The Kolmogorov-Smirnov test was used to assess normal distribution. Due to non-normal distribution ($P<0.05$), non-parametric statistical tests were applied. frequency of maternal age, gestational age and LBW, and relationships between variables and low birth weight were examined using the Spearman test, followed by Linear Regression to analyze the impact of each factor.

Result

This is a cross sectional study conducted on 384 women aged over 35 years old. prevalence of LBW among women elder than 35 years old (81.35 %). frequency for age and weight of children and gestational age is shown in Table1.

Table 1frequency of maternal age, gestational age and LBW

		Age (Year)	Child birth weight (gram)	Gestational age (weeks)
N	Valid	384	384	384
	Missing	0	0	0
Median		37.00	2300.00	38.00
Range		6	900	5
Minimum		36	1500	37
Maximum		42	2400	42

In this study 93.23% of mothers have gestational age of 37-39 week and the remaining 6.77% have gestational age of 40-42 weeks. In addition, 50.26% of mothers have parity number between 5-8 while 39.58% have parity number between 5 -8 but only 10/16% of mothers were recorded with parity number between 9-12.

Result of spearman correlation test shows existence of significant moderate monotonic linear negative correlation (r_s= -0.400, P=0.00) between age of mothers and birth weight. In addition there is weak monotonic linear positive correlation exists between gestational age and birth weight (r_s= 0.159 , P=0.00). There is significant negative weak correlation between number of parity and birth weight (r_s=-0.22, P=0.00).

Table2. linear regression result for birth weight and associated factors

Model		Unstandardized Coefficients[a]		Standardized Coefficients[a]	t	Sig.	Model summary			
		B	Std. Error	Beta			R	R square	Adjusted R square	Std.Error of the Estimate
1	(Constant)	5408.363	229.700		23.545	.000				
	Age of mother	-85.154	6.200	-.575	-13.735	.000	.575	.331	.329	148.887
	Gestational age	22.779	9.506	.122	2.396	.009	.122	.015	.012	180.620
	parity	-25.360	4.577	-.273	-5.541	.000	.273	.074	.072	175.073

a. Dependent Variable: Birth weight

In this study from all child births just 7 were twins. Therefore because of small sample size of twins correlation of child birth weight with single birth or twin birth could not determine instead Mann Whitney U test explained that there are no significant differences of LBW exists between single birth and twin births (P=0.100). Therefore, the factors significantly influence the birth weight of child are age of mother, gestational age and number of parities, although gestational age and number of parities have their influence but effect is not considerable.

Result of linear regression as illustrated in Table 2 shows that age of mother has moderate influence on child birth weight as for every year increase in age of mother there is 85 gram decrease in birth weight (R^2=0.33, P=0.00)., similarly result of linear regression of gestational week and birth weight ((R^2 =0.015, P=0.009) shows a significant

but week influence of gestational age on child birth weight , that 22.7 grams of child weight increase is observed for every week increase in gestation but this effect is very weak, In addition a significant weak influence of number of parity on child birth weight was shown that when the number of parity increase by one there will be 25.3 grams decrease of child birth weight but this influence is very weak. (R^2=0.074,P=0.00).

Discussion

This study was conducted to examine the prevalence and associated factors of low birth weight among mothers over 35 years old in Shahrara Maternity Teaching Hospital in 2024. The results showed that the prevalence of low birth weight in this age group was approximately 81.35%.

In China, Shanshan Wang et al. (2020) conducted a study of 49,143 women who gave birth between 2015 and 2018. Birth weight increased annually by 16.204 g for mothers under 24 years, 12.051 g for those aged 24–34, and decreased by 0.824 g annually for those aged 34–36. These results indicate that maternal age over 35 is associated with lower birth weight, aligning with this study findings. Current study revealed that with each year of increased maternal age, birth weight decreased by 85 g. [13] Another study in Rawalpindi by Usman Zafar et al. (2021), conducted between June 2016 and June 2020 on 20,681 women, reported that 75% of low-birth-weight cases occurred before 37 weeks of gestation, which closely aligns with the current study that also indicates a weak association of gestational age with birth weight. The weaker association in our study may be due to the smaller sample size and different in duration of conducting research [14]. Another study by Parvati Nair et al. (2023) in India, collecting data from January to December 2021, analyzed records of 4,266 mothers. Among them, 46.65% were aged 21 to 25, and the prevalence of low birth weight was 41.3%. This study found a significant relationship between birth weight and maternal age, parity, place of residence, and newborn gender. [15] similarly, this research also shows association between parity and birth weight

A study by Ismatullah Darman (2024) at Mirwais Regional Hospital (MRH) in Kandahar revealed that prevalence of low birth weight was 17.3%. The difference from the current study may be due to its focus on mothers over 35 years and a one-year duration, while the Kandahar study covered only three months and a broader age range. [16] Similar studies in neighboring countries also presented comparable results.

Ramads G. Narwade et al. (2018) conducted a cross-sectional study from April 2012 to June 2014 in Kinwat, Nanded, Maharashtra, India, on 1,611 mothers, and reported an 18.56% prevalence of low birth weight .[17] . study by Mehdi Shokri et al. (2020) in Iran reported a low-birth-weight prevalence of 7.95%, and identified maternal age below 18 and above 35, inadequate prenatal care, preterm birth, and history of LBW, multiple pregnancies, and high blood pressure as risk factors. [18] the difference of prevalence of these two researches with this study may be due to focusing of this study only on mothers over 35 years. This results also align with a study by Alehegn Bekele et al (2018) at Tikur Anbessa Specialized Hospital, where mothers over 40 year had higher risks of delivering low birth weight infants compared to those aged 30–34). Also, mothers with parity above 5 had a significantly higher risk compared to those with parity less than two. [19]

Despite the valuable findings, this study had several limitations. Firstly, it was conducted in only one maternity hospital, limiting generalizability. Secondly, the low number of twin births reduced our ability to analyze their association with low birth weight. Lastly, important variables such as maternal nutrition, prenatal care, and educational level were not considered, although they may influence birth weight.

Conclusion

The results of this study showed that the prevalence of LBW among mothers over 35 years at Shahrara Maternity Teaching Hospital is alarmingly high, indicating a serious public health challenge. Factors such as higher parity and gestational age also contributed to the prevalence of LBW, which requires special attention in prenatal care planning. Therefore, it can be concluded that continuous, regular, and targeted care for mothers over 35, along with education about potential health risks and timely diagnosis and management of medical conditions, can play a significant role in reducing the prevalence of low birth weight.

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Authors Contribution

Hafiza Reza: conceptualization, data collection, data entry, drafting, publishes the article.

Brishna Dawlaty: Guidance, conducted the data analysis and final editing.

Shahar Bano Taheri assisted in data collection.

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