Maternal Demographic Determinants of Low Birth Weight Babies in District Jhang (Pakistan)

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Abstract

The study was conducted to investigate the maternal demographic determinants of low birth weight babies in district Jhang, Pakistan. In the study demographic characteristics of mothers of low birth weight babies were observed. These characteristics were residential area, education level, socio-economic status, age of mothers at the time of birth and pregnancy interval. These all mentioned characteristics were taken as independent variables against the dependent variable, low birth weight of infants. A sample size of 220 mothers who gave birth to a low weight baby was surveyed through purposive sampling technique in government hospitals of District Jhang and its Tehsils. Data was entered and analyzed by using SPSS. One way analysis of variance with mean plots was used to find out the mean differences between maternal demographic characteristics and low birth weight of babies. Rural women, comparatively aged women, early married women and low educated women were found to have extremely low birth weight babies.

Keywords: *Low birth weight babies; Maternal Demographic determinants; Pakistan*

1. Introduction

World Health Organization (1992) classifies infants with birth weights of less than 2,500 grams as Low Birth Weight (LBW). World-wide, regarding 16% of newborns, or over 20 million infants per year, are born with less than 2.5 kg of weight and interestingly more than 90% of them are born in developing countries (Roudbari et al., 2007; WHO, 2004). LBW indicates present and past health status of the mother and is also associated with infant growth (Harun-or-Rashid & Sakamoto, 2010). The incidences of LBW assume as a general indicator of morbidity, both mothers and children, and consider a significant determinant of social circumstances in the future (Roy et al., 2009). New born LBW babies face an elevated chance of higher rates of morbidity and mortality caused by infectious diseases in the neonatal, childhood and adulthood (Kodzi & Kravdal, 2013; WHO, 2004; Strauss, 2000; Huxley et al., 2000). Thus LBW has been debated as one of the major causes of neonatal death (Rizvi et al., 2007; Bhutta, 1997).Despite of the efforts made in reducing incidences of LBW worldwide, the issue remains an ongoing policy concern for the global health. Therefore, World Health Organization (WHO) and United Nation Development Program (UNDP) are continuously addressing this issue through their developmental programs (Haggaz, Radi & Adam, 2010; Wardlaw, 2004).

Various factors cause LBW and these factors vary across the globe (Fraser, Brockert, & Ward, 1995). Kramer (1987) categorized the determinants of LBW in seven categories and identified 43 factors. He placed demographic and psychological factors at second level. The factors included in this category were maternal age, socio-economic status (education, occupation and income) and psychological factors. Thus, maternal characteristics determine new born baby's health and consider major predictor of LBW babies. These characteristics include; socio-demographic status, mother's education, mother's age at the time of birth, pregnancy interval and weight before pregnancy. Studies suggest

that socio-demographic status play a part to affect unfavorably birth weight (Meggiolaro, 2009;Mulder et al., 2002; Pattenden et al., 1999). Findings show that less educated mothers are at greater risk of producing LBW baby (Arif et al, 1998). Teenage mothers and those aged 35 or more are more likely to have LBW baby (Machado, 2006; Khoshwood, 2005; Astolfi & Zonta, 1999; Amin & Sampathkumar, 1993).

Jafari *et al.* (2010) analyzed the factors of LBW in Iran. The primary objective of their study was to describe socio-economic and medical factors related to LBW when have people free and universal access to primary health care. A sample of 4510 respondents was surveyed from the hospitals. Their findings showed that mothers' education was one of the key determinants in LBW babies. Li and Sung (2007) did a longitudinal study to investigate the socio-cultural factors of LBW babies in Taiwan. The findings reported an association between mothers' education and the prevalence of LBW babies.

Rocha et al. (2010) conducted a study with Brazilian adolescents for analyzing maternal age as a factor of LBW. A sample of 1124 participants was investigated. Findings showed that the rate of low birth weight were significantly higher among young adolescents as compared to older adolescents and young adults. Fraser, Brockert and Ward (1995) also earlier reported that the prevalence of LBW babies was much higher than in adolescent mothers and young adult mothers.

Furthermore, studies show higher risks of LBW children at low parities (Wilcox, 2001; Wilcox, Cheng & Johnson, 1996) and tend to be high birth weights with parity up to a certain level (Phung et al., 2003; Wilcox, Cheng & Johnson, 1996). The literature confirms that short or long pregnancy intervals can increase risk of various adverse birth outcomes, particularly incidences of LBW babies (Zhu, 2005; Klerman et al., 1998). Pre-pregnancy weight and body mass index (BMI) also determine the prevalence of LBW (WHO, 1995).

2. Situation in Pakistan

Globally 7.6 million children died in 2010 before reaching their fifth birthday and 40% of these deaths occur in the neonatal period (Nisar & Dibley, 2014). One of the major reasons of neonatal mortality is the LBW of new born babies. In Asia the prevalence of LBW babies has prominent variation. The higher rates are in South Asia and the lower in East Asia. Pakistan has the third largest rate of neonatal mortality globally (Nisar & Dibley, 2014). This is because of the higher level of prevalence of LBW babies. In various regions of Pakistan LBW proportion varies from 5% to 23.3%. Up to 25% of infants are classified as LBW in Pakistan (Rizvi et al., 2007). During 2008-12, this LBW rate has estimated 32% in Pakistan (UNICEF, 2014).

In order to determine LBW in urban Pakistan, Janjua *et al*. (2008) conducted a cross sectional study in Karachi. The selection criteria of the respondents were those women who: (i) showed consent to participate in the study; (ii) resided in Karachi for last one year; (iii) admitted for delivery in one of the two study hospitals; and (iv) planned to deliver a singleton at term (37–42 weeks of gestation). By following this criteria, a sample of five hundred and forty mother–infant pairs were interviewed. The outcome variable of this study was LBW babies. Descriptive statistics showed that most of the mothers were young as average age (median) were reported as 25 years. The researchers concluded after statistical analysis that poor nutritional status and inadequate prenatal care were major determinants of LBW. In Pakistan, there has been paucity in research about the demographic determinants of mothers of LBW babies. Thus this research study aims to investigate the demographic maternal determinants of LBW babies.

3. Methods and Materials

A cross-sectional survey was conducted in District Jhang and its Tehsils. In this study, demographic characteristics of mothers of LBW babies were observed in which residential area, education level, current age and age at marriage of mothers were included. These all mentioned variables were taken as independent against the dependent variable, which was the low birth weight of infants. Target population for this study was the mothers of LBW babies who were newly born. Mothers of newly born babies were studied because with the time baby may gain the weight and it may be difficult to take them as LBW babies. Newly born baby was defined in this study as "infant" i.e. who are less than one month of age. The respondent mothers were approached in gynecology ward of hospitals and maternity homes of following government hospitals namely; District Headquarter Hospital Jhang, Tehsil Headquarter Hospital Jhang, Tehsil Headquarter Hospital Shorkot and Tehsil Headquarter Hospital Ahmad Pur Sial. A criterion for respondent selection was adopted i.e. mothers who gave birth to a baby of less than 2.5 kg weight (WHO, 1995) before not more than one month. A sample size of 220 respondents was surveyed from these hospitals during May 2014-September 2014. Interview schedule was used as data collection tool and researcher interviewed the respondents or their attendants in local language. After collecting the data, it was entered and analyzed through Statistical Package for Social Sciences (SPSS).

4. Results and Discussion

Table 1 presents the descriptive statistics of surveyed respondents. The findings indicate that majority, 178 (81%), of the respondents belonged to the rural areas whereas less than one fifth, 42 (19%), of respondents were from urban areas. The second maternal characteristic was mothers' level of education. The results reveal that 124 (57%) of the mothers completed middle level education while 46 (21%) of the respondents did their matriculation. However, 32 (15%) of respondents attended intermediate college and 14 (6%) of respondents did their graduate from the college. There were only 4 (2%) of mothers who were post graduates.

Table 1: Descriptive Results of Maternal Demographic Variables for LBW

Response Category	Frequency	Percentage %
Residence		
Urban	42	19
Rural	178	81
Level of Education		
Illiterate	28	13
Primary	42	19
Middle	54	25
Matriculation	46	21
Intermediate	32	15
Bachelors	14	06
Masters	04	02
Socioeconomic Status		
Lower	38	17
Lower middle	154	70
Middle	28	13
Mothers' age at the time of Child birth		
<18 years	24	11
18-24 years	64	29
25-34 years	108	49
>34 years	24	11
Last Pregnancy Intervals		
Less than 12 months	48	22
12-18 months	94	43
19-24 months	50	23
More than 24 months	28	12
Weight before Pregnancy		
Below 45 Kg	46	21
45-60 Kg	114	52
Above 60 Kg	60	27

Table 1 presents the information of socio-economic status of mothers as well. The findings reveal that 154 (70%) of mothers belonged to the lower middle class while 38 (17%) of them were from lower class and a marginally less number of respondents 28 (13%) were from middle class. Regarding the age of mothers at time of birth, almost half 108 (49%) of the respondents reported their age between 25 to 34 years and 64 (29%) of them indicated their age between 18 to 24 years. Nevertheless, 24 (11%) of respondents said that their age were less than 18 years and similar proportion of respondents reported their age above than 34 years.

Table 1 also presents the descriptive results of pregnancy interval. Most of the mothers, 94 (43%), indicated their last pregnancy interval between 12 to 18 months while 50 (23%) respondents had their last pregnancy interval between 19 to 24 months. Only, 48 (22%) mothers were having last pregnancy interval of less than 12 months. As for the mothers' weight before pregnancy, the results show that a significant majority 114(52%) of respondents had weight between 45 to 60 Kg while 60 (27%) reported their weight above than 60 Kg. There were only 46 (21%) of respondents who said that their weight was less than 45 Kg.

Figure 1 represents mean plots for each independent variable against dependent variable, Low Birth Weight. Mean plots shows that there are differences among weight of baby for demographic maternal determinants. It is found that mothers with low level of education and low weight had at the greater risk of producing low birth weight babies as

compared to those who had high level of education and high weight. The findings also reveal that mothers with less than 18 years of age and those aged 35 or more had more risk of low birth weight outcomes while mothers with last pregnancy interval of less than 12 months and mothers with low socio-economic status were at higher risk of low birth weight children. In order to see the differences between maternal demographic variables and prevalence of LBW babies, one way analysis of variance was performed and partial eta squared was calculated. The findings were presented in Table 2.

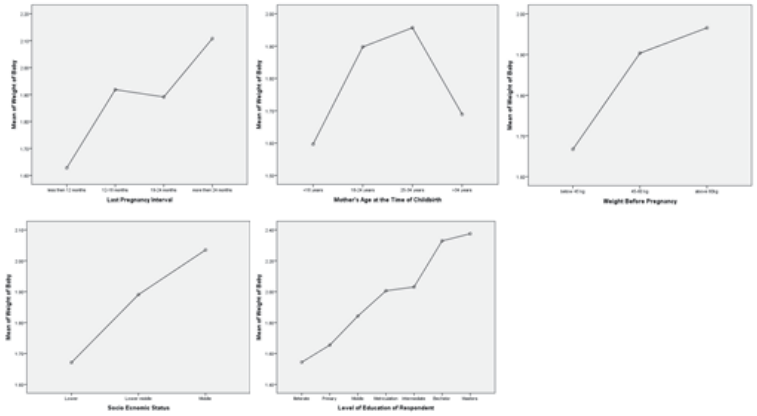

Figure 1: Maternal Demographic Variable's Mean Plots for LBW

Table 2 indicates that demographic maternal variables; level of education ($F = 11.713$, $p < 0.01$, $\eta = .06$), last pregnancy interval ($F = 7.590$, $p < 0.01$, $\eta = .09$), mothers' age at the time of birth of baby ($F = 5.364$, $p < 0.01$, $\eta = .12$), Weight before pregnancy ($F = 5.830$, $p < 0.05$, $\eta = .14$) and Socio-economic status ($F = 5.247$, $p < 0.01$, $\eta = .07$), significantly differed with prevalence of LBW babies.

Table 2: Maternal Demographic Determinants for LBW

Variables	F-Value	Partial Eta Squared (η)
Level of Education	11.713	0.06**
Last pregnancy interval	7.590	0.09**
Mothers' age at the time of birth of baby	5.364	0.12**
Weight before pregnancy	5.830	0.14*
Socio-economic status	5.247	0.07**

**P-value < 0.01, *P-value < 0.05

These findings confirmed the results of mean plots that mothers with low level of education and low weight were at the greater risk of producing low birth weight babies as compared to those who had high level of education and high weight. Furthermore, mothers with less than 18 years of age and those aged 35 or more had more risk of low birth weight outcomes while mothers with last pregnancy interval of less than 12 months and mothers with low socio-economic status were at higher risk of low birth weight children. These findings concludes that low socio-economic status, low weight of mother before pregnancy, last pregnancy interval, mother's age at the time of deliver and low level of education of mothers are the main causes of low birth weight among infants in Jhang, Pakistan.

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