

Impact of Birthweight on Behavioural Development in Early Childhood Years: A Comparative Study

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Abstract: Background: The early childhood years are a crucial period for children's overall development. Behavioural problems are known as deviant in normally accepted behaviours. The behavioural problems among preschoolers are increasing nowadays due to changes happening in the lifestyle, family structure, food, and higher mobile usage. It's been proven that behavioural problems during early childhood years are indicators of later years' emotional well-being, maintaining relationships, academic readiness etc. It is also considered as predictors of difficulties in the later years of life. Early screening and identification of behavioural problems is indispensable for timely intervention. Children attending Anganwadi centres represent a vibrant population for behavioural screening in community settings. Objectives: 1) To assess behavioural problems among Anganwadi children 2) To find the association between demographic variables and behavioural outcome among the samples. Methodology: A community-based cross-sectional descriptive study was conducted among 60 preschool aged 2-4 children attending at selected Anganwadi centres in Mysuru. Behavioural Problems was assessed by using standardized tool Strengths and Difficulties Questionnaire, Demographic data were collected through self-developed questionnaire. Data were analysed using descriptive and inferential statistics. Frequencies, percentage, chi square were calculated. Results: Majority of LBW (46.7%) children were noticed very high behaviour problem and Majority of NBW (46.7%) NBW children were observed under close to average level of behaviour. This depicts that LBW children are reported to have more behavioural problems than LBW children. The χ^2 results for birthweight groups show highly significant p-values ($p < 0.001$), indicating that the association with level of behavioural problem between LBW and NBW children are statistically significant. Conclusion: Behavioural problems were common among preschool children attending anganawadi centres. Routine behavioural screening within community child care settings may facilitate early identification and early intervention.

Keywords: Behavioural Problems, Early childhood years, Preschool, Anganwadi, SDQ

1. Introduction

Birth weight (BW) is closely related to lifelong health. It is the first weight of the new born recorded soon after birth. For live births, BW should preferably be measured within the first hour of life, before significant postnatal weight loss has occurred. The World Health Organization (WHO) has been defined the term LBW as a BW of less than 2500g (up to and including 2,499 g) or 5.5 lbs, irrespective of the duration of the gestational period. Some babies are small for gestational age (SGA) i.e. their BW is less than the 10th percentile for gestational age. LBW is further classified as very low birth weight (VLBW, <1500 g) and extremely low birth weight (ELBW, <1000 g). (WHO 2014).

As per the WHO estimates, globally about 25 million LBW babies are born each year, nearly 95% of them in the developing countries. According to the UNICEF estimate, almost every third newborns (30%) in India is LBW. The NFHS-3 reported the proportion of LBW babies about 23% for rural and 19% of urban population. As per NFHS-3 data, the infant mortality rate is 49/1000 live birth for an average or large size baby, but it is 62/1000 live birth for a smaller than average baby and 129/1000 live birth for a very small baby. (UNICEF, 2004)

According to district level household survey 2012-13, the prevalence of low birth weight infants in Karnataka state is

7.6% while it is 11.5% in Mysore district. Survival rates of low birthweight children increased dramatically over the last two decades, unfortunately this increase has not been accompanied by decreased neonatal morbidity or improvement in short term outcomes, but by an increase in the absolute number of children with health and developmental problems. This has raised the problem of correct evaluation of their postnatal growth. The growth low birthweight infants are known to be very different from higher birthweight, full term infants, widespread agreement has now been achieved on the need for longitudinal studies on low birthweight infants to evaluate their postnatal growth. (Choudhary et.al, 2014).

Behavior problems among children are a deviation from the accepted pattern of behavior on the part of the children when they are exposed to an inconsistent social and cultural environment. (Reddy et.al, 2016)

A behavior is defined to be a problem if the behavior give rise to significant disturbance to the psychological well-being and the future life of the child and needs early intervention by professionals. (Srivastava et.al, 2012) In the recent years, we are observing more children coming to school with behavior problems than ever before and teachers face the challenge of managing their behavior. (Reddy et.al, 2016)

Community studies have identified that more than 80% of

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pre-schoolers have mild tantrums sometimes but a smaller proportion, less than 10% will have daily tantrums, regarded as normative misbehaviours at this age. Challenging behaviours and emotional difficulties are more likely to be recognized as “problems” rather than “disorders” during the first 2 years of life. (Samarakkody et.al, 2010)

Behaviour problems referred to as challenging behaviours is one of the core features of children at risk of developing special needs. Behaviour which is inappropriate to the situation, repetitive and not age-appropriate some early alarm for parents and teachers of young children. Early childhood, defined as the period from birth to eight years old, is a time of remarkable growth with brain development at its peak. During this stage, children are highly influenced by the environment and the people that surround them. (UNESCO, 2021)

Child behavior may also influence how and what parents feed their children. For example a study found that mothers fed more sweet foods and drinks to infants exhibiting either or both internalizing and externalizing behaviors, perhaps in an effort to calm them. Weight-based stigma is commonly hypothesized to mediate the association between weight and psychological problems, and children are stigmatized for being overweight as early as age 3 years. These explanations include common causes of weight and behavior, pathways that indicate weight status precedes behavioral problems, and pathways that indicate the opposite—that behavioral problems precede weight. (Achenbach et.al, 1978)

The present study was conducted to assess the impact of birthweight on behavioural development on early childhood years, children attending Anganwadi at Mysuru.

2. Objectives

- To assess behavioural problems among Anganwadi children

- To find the association between demographic variables and behavioural outcome among the samples.

3. Methodology

A community-based cross-sectional descriptive study was conducted among 60 preschool-aged 2-4 children attending selected Anganwadi centres in Mysuru through a purposive random sampling method. The permission was sought from the Institutional Ethics Committee; ethical guidelines were followed throughout the study. Demographic data were collected through a self-developed questionnaire that contained the details of the samples and family details. Behavioural Problems was assessed by using standardized tool **Strengths and Difficulties Questionnaire (SDQ)**, The SDQ parent version consists of 25 items distributed across five domains:

- 1) Emotional Symptoms
- 2) Conduct problems
- 3) Hyperactive/Inattention
- 4) Peer Relationship Problems
- 5) Prosocial Behaviour

Each item scored 3 point scale Total Difficulty It consists of 25 items, for each item, scored 3 point scale can be marked in the provided box for Not True, Somewhat True or Certainly True, the answers must be based on the child's behavior over the last six months. The total Score ranges from 0-40. The category ranges close to average, slightly raised, High, /Very High. The collected data were tabulated and analysed in SPSS, using descriptive and inferential statistics. Frequencies, percentage, chi square were calculated based on objectives.

4. Results

Table 1: Frequency and percentage distribution of socio demographic variables.

Demographic Variables		LBW		NBW	
		Frequency	Percentage	Frequency	Percentage
Gender	Boys	17	56.7	09	30.0
	Girls	13	43.3	21	70.0
Age	2-3 years	15	50.0	20	66.7
	3-4 years	15	50.0	10	33.3
Mother's Age at conception	<25 years	21	70.0	14	46.6
	25-30 years	5	16.7	8	26.7
	30-35 years	4	13.3	8	26.7

Table 1- depicts the distribution of low birthweight and normal birthweight children by gender, age, mother's age at conception, The findings indicate, 30% of normal birthweight and 56.7% of low birthweight children were boys, whereas 70% of normal birthweight and 43.3% of low birthweight children were girls. Concerning children's age, 50% of low birthweight are falls under 2-3 years and 3-4 years respectively. Whereas 66.7% and 33.3% of normal birthweight children belonged to 2-3 years and 3-4 years, respectively. About mother's age at conception, 70% of low birthweight children mothers and 46.6% of normal birthweight children's mothers were <25 years age at conception. Whereas 16.7% of low birthweight and 26.7%

of normal birthweight children's mothers belonged to 25-30 years at conception.

Table 2: Distribution of samples based on prevalence of Behaviour problems

Level	Behavioural Problems				χ^2 df p value
	LBW		NBW		
	F	%	F	%	
Close to average	3	10.0	14	46.7	13.920* 3 0.003
Slightly raised	5	16.7	6	20.0	
High	8	26.7	6	20.0	
Very high	14	46.7	4	13.3	

*Indicates significant at $p < 0.05$ **indicates significant at $p < 0.01$.

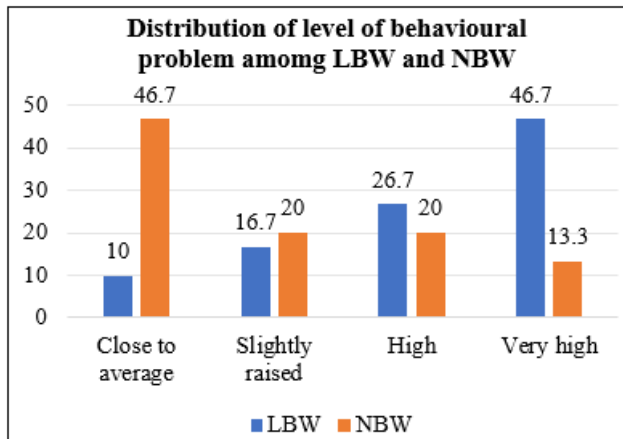


Figure 1: Distribution of the level of behaviour problem among samples

Table 2 reveals the frequency, percentage and association between the level of behaviour problem and birthweight of the samples.

A Higher percentage (46.7) of LBW children than (13.3%) of NBW children was noticed under a very high level of behaviour problems. A slightly higher percentage (26.7%) of LBW children than (20.0%) was found under a high level of behaviour problems. A slightly higher percentage (16.7) of LBW children than (20.0%) was found under a slightly raised level of behaviour problem. A lesser percentage (10) of LBW children than (46.7%) of NBW children was noticed under close to average classification of behaviour problem. Statistically significant association was found between the level of behaviour problems and birthweight groups ($\chi^2 = 13.920$ at $p < 0.003$).

Table 3: Gender wise distribution of samples based on the level of behaviour problems.

Level of the behaviour problem	LBW				NBW			
	Boys		Girls		Boys		Girls	
	F	%	F	%	F	%	F	%
Close to average	2	11.8	1	7.7	5	55.6	9	42.9
Slightly raised	3	17.6	2	15.4	1	11.1	5	23.8
High	5	29.4	3	23.1	2	22.2	4	19.0
Very high	7	41.2	7	53.8	1	11.1	3	14.3
χ^2	0.509				0.805			
df	3				3			
p value	0.917 NS				0.848 NS			

*Indicates significant at $p < 0.05$ **indicates significant at $p < 0.01$, NS indicates Not Significant

Table 3 reveals that, frequency, percentage and association between gender and the level of behaviour problem among samples. A higher percentage of boys (11.8) than (7.7%) girls were seen under close to average level of behaviour problem among LBW children, whereas a higher percentage (55.6) of boys than (42.9%) girls were observed under close to average level of behaviour among NBW children. A slightly higher percentage of boys (17.6) than (15.4%) girls were seen under slightly raised level of behaviour problem among LBW children, whereas a higher percentage (23.8) of girls than (11.1%) of boys were observed under slightly

raised level of behaviours among NBW children. A slightly higher percentage of boys (29.4) than (23.1%) girls of LBW children and a slightly higher percentage (22.2) of girls than (19.0%) of boys were observed under high level of problem behaviours among NBW children. A higher percentages of girls (53.8) than boys (41.2%) of LBW children and slightly higher percentage (14.3) of girls than (11.1%) of boys were observed under high level of problem behaviours among NBW children. There was no statistically significant association was observed between gender group and birthweight groups.

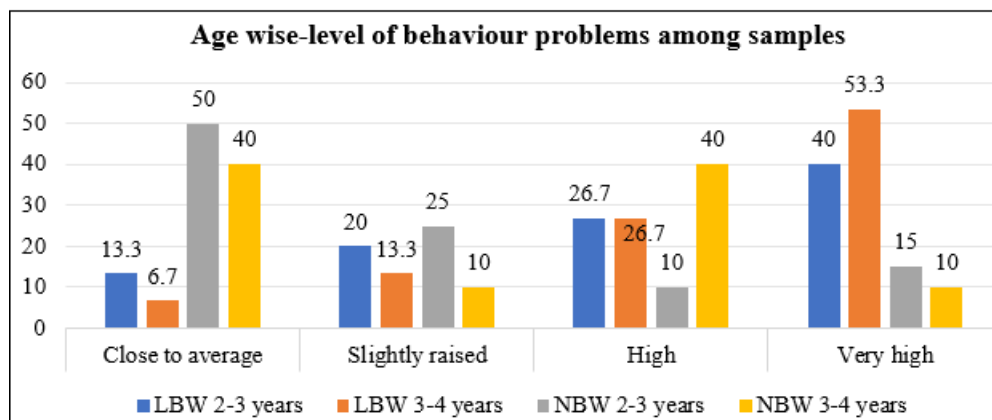


Figure 2: Age wise-level of behaviour problems among samples

Table 3 reveals that, frequency, percentage and association between age and level of behaviour problem among samples. A higher percentage of 2-3 years (11.8) than (6.7%)

3-4 years were seen under close to average level of behaviour problem among LBW children, whereas higher percentage (50.0) of 2-3 years than (40.0%) of 3-4 years

were observed under close to average level of behaviours among NBW children. A slightly higher percentages of 2-3 years (20.0) than (13.3%) 3-4 years were seen under slightly raised level of behaviour problem among LBW children, whereas higher percentage (22.0) of 2-3 years than (10.0%) of 3-4 years were observed under slightly raised level of behaviours among NBW children. Equal percentages (26.7) of 2-3 years and 3-4 years of LBW children and higher percentage (40.0) of 3-4 years than (10.0%) of 2-3 years

were observed under high level of problem behaviours among NBW children. Higher percentages of 3-4 years (53.3) than (40.0%) 2-3 years of LBW children and slightly higher percentage (15.0) of 2-3 years than (10.0%) of 3-4 years were observed under a high level of problem behaviours among NBW children. No statistically significant association was observed between age groups and birthweight groups.

Table 4: Level of behavior problems of samples based on mothers age at conception.

Birthweight/ mothers age at conception/ behavioural problems	Close to average		Slightly raised		High		Very high		Total		χ^2 df p value
	F	%	F	%	F	%	F	%	F	%	
LBW	<25 years	1	4.8	5	23.8	2	9.5	13	61.9	21	19.301 6 0.002**
	25-30 years	2	40.0	0	0.0	3	60.0	0	0.0	5	
	30-35 years	0	0.0	0	0.0	3	75.0	1	25.0	4	
	Total	3	10.0	5	16.7	8	26.7	14	46.7	30	
NBW	<25 years	6	42.9	4	28.6	2	14.3	2	14.3	14	6.403 6 0.380NS
	25-30 years	5	62.5	2	25.0	1	12.5	0	0.0	8	
	30-35 years	3	37.5	0	0.0	3	37.5	2	25.0	8	
	Total	14	46.7	6	20.0	6	20.0	4	13.3	30	

*Indicates significant at $p < 0.05$ **indicates significant at $p < 0.01$, NS indicates Not Significant

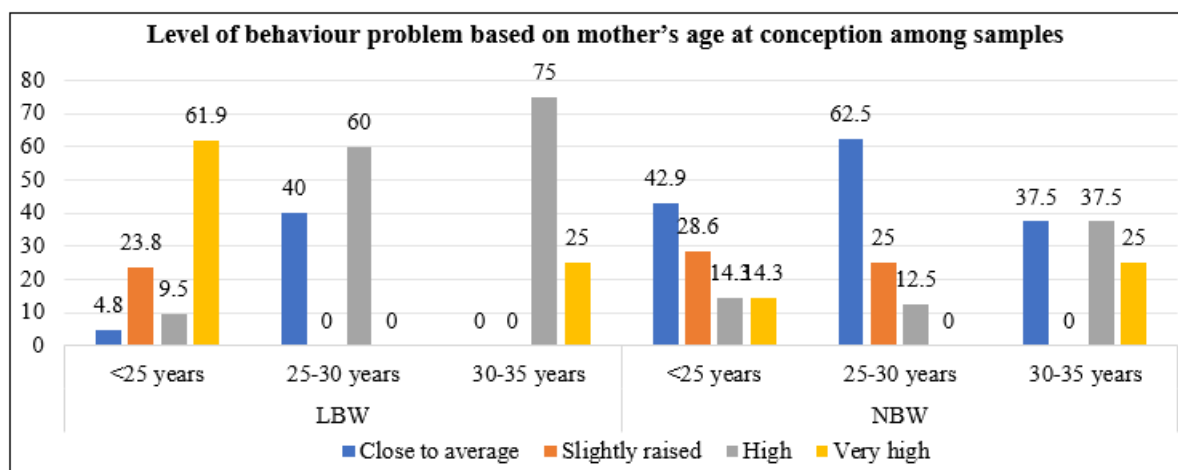


Figure 3: Level of behaviour problem based on mother's age at conception among samples

Table 4 reveals that, frequency, percentage and association between mother's age at conception and level of behaviour problem among samples. Majority of LBW (61.9%) were found <25 years of age were observed under very high behaviour problem followed by (75%) of 30-35 years mother's age at conception under high behaviour problem category and 60% of 25-30 years mothers age at conception were found under high behaviour problems among Low Birthweight children. Among NBW children mother's, majority (62.5%) of close to average behavior category were observed under the age group of 25-30 years, mother's age at conception followed by (42.9%) under <25 years age group and 37.5% of close to average behaviours were observed under 30-35 years age group category. Very high behaviour problem (25.0%) was observed with 30-35 years age group. There was no statistical significant association was observed between family monthly income group and Normal birthweight groups. Statistically highly significant association was found between level of behaviour problems and low birthweight groups ($\chi^2=19.301$ at $p < 0.002$). Every 5-year increase in maternal age was associated with a 12% decreased risk for externalizing behavior in offspring, and a

6% increased risk for internalizing behaviors (Jessica, 2015).

5. Summary and Conclusions

Sample's Gender

Boys: A higher percentage of LBW children were boys (56.7%) compared to NBW children (30.0%). **Girls:** Conversely, a higher percentage of NBW children were girls (70.0%) compared to LBW children (43.3%).

Sample's Age

2-3 Years: The proportions of LBW children in this age range (50.0%) is lower than that of NBW children (67.7%).

3-4 Years: The LBW children in this age range (50.0%) are comparable to NBW children (32.3%). This might indicate that LBW children catch up in growth as they age, but they are still a significant portion in this bracket.

Mother's Age at Conception

<25 Years: A higher percentage of LBW children are born to mothers under 25 years (70.0%) compared to NBW children (46.6%). This suggests a potential association

between younger maternal age and increased risk of LBW. **25-30 Years and 30-35 Years:** The proportions are closer between the two groups, though LBW children have a lower percentage in both age ranges compared to NBW children. This may indicate that maternal age beyond 25 years is less associated with LBW.

Behavioural problems

Majority of LBW (46.7%) children were noticed very high behaviour problem and Majority of NBW (46.7%) NBW children were observed under close to average level of behaviour. This depicts that LBW children are reported to have more behavioural problems than LBW children.

The χ^2 results for birthweight groups show highly significant p-values ($p < 0.001$), indicating that the association with level of behavioral problem between LBW and NBW children are statistically significant.

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