AWARENESS REGARDING LOW BIRTH WEIGHT AND ITS ASSOCIATED FACTORS AMONG GYNECOLOGICAL OUTPATIENTS OF REPRODUCTIVE AGE

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ABSTRACT

Objective: To determine the awareness of factors associated with low birth weight and its associated factors among women of reproductive age attending gynecology OPD at a private tertiary care hospital of Karachi.

Methods: A cross-sectional study was conducted from April 2022 to January 2023 at a private tertiary care hospital of Karachi. Married gynecological outparticipants of reproductive years were included in the study with a sample size of 385 through online Openepi online calculator after taking their written informed consent. Data was analyzed on SPSS version 21 whereas inferential analysis was performed by applying binary logistic regression with a significance level of 0.05 considered statistically significant.

Results: The mean age of the participants was 30.79±6.00 years, 174 (43.5%) of them were multipara whereas 105 (26.3%) of them were primipara. Moreover, 284 (71.0%) study respondents had inadequate awareness regarding low birth weight. Multivariable analysis further revealed that patient education was significantly associated with the awareness level where participants with primary or secondary education had significantly higher odds of having adequate awareness regarding low birth weight than those who were illiterate (AOR=2.52, 95% CI 1.01-6.27, p=0.046 and AOR=6.99, 95% CI 2.94-16.63, p<0.001 respectively).

Conclusion: More than two-thirds of study respondents had inadequate awareness regarding low birth weight. Moreover, education level of mothers was found to have a significant association with their awareness level. It is recommended that specific targeted interventions in the form of media campaigns, public seminars and community meetings are needed to enhance awareness of women of reproductive age in our society regarding the factors affecting low birth weight.
Keywords: Awareness, Low Birth Weight, Gynecology, Outpatients

INTRODUCTION

Low Birth Weight is one of the biggest public health issues, particularly in developing and under developed nations. [1] The World Health Organization defines it as 'weight at birth of < 2500 grams'.[1] Despite ongoing efforts to improve mother and child health, 14.7% of all babies born globally in 2020, or 19.8 million infants, suffered from low birth weight.[2]

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The situation is worse in South Asia, where up to 50% of all newborns have low birth weights.[3] Locally in Pakistan, recent studies put the estimate of low birth weight between 8.9% to 16.9%.[4, 5]

Low birth weight may result from a variety of maternal and fetal factors that are interconnected. A recent systematic review reported maternal age, body mass index, preterm childbirth, and diagnosis with a maternal chronic disease to be the most common causes of low birth weight.[5] A previous multi-country study reported maternal age, inadequate antenatal care, illiteracy, delayed conception, low body mass index and poor socioeconomic status to be the significant determinants of low birth weight in children.[6] Other risk factors of low birth weight reported include gender of newborn, short maternal stature, poor maternal nutrition prior to pregnancy and low weight gain during pregnancy, insufficient dietary intake, inadequate prenatal care,

multiple births and pregnancy related medical complications.[7, 8, 9]

Birth weight affects a newborn's chances of surviving, developing, and maintaining long-term health in addition to being a predictor of the mother's health state. It has been reported that low birth weight children are significantly more likely to develop both stunting and wasting than children with normal birth weight.[10]

In Pakistani culture a majority of newborns are cared for by their mothers, it is therefore crucial that their awareness about the potential causes of low birth weight is sufficient enough. To the best of researchers' knowledge, recent local literature on awareness of mothers regarding factors related to low birth weight is severely limited. This research was therefore performed to determine the awareness regarding low birth weight and its associated factors among women of reproductive age attending gynecology OPD at a private tertiary care hospital of Karachi. By adding to the local evidence base, the findings of this study can help in devising effective future strategies to improve maternal awareness regarding low birth weight.

PARTICIPANTS AND METHODS

After taking ethical approval, a cross-sectional study was conducted from April, 2022 to January, 2023 at a Civil hospital of Karachi. Married gynecological OPD participants of reproductive years were included whereas those lacking mental capacity to give written informed consent were excluded from the study.

For sample size estimation, the percentage frequency of the study outcome was kept at 50% for most liberal estimate, and by using 95% confidence level and 5% precision, the required sample size was calculated to be 385 participants through online Openepi online calculator.[11] Non-probability purposive sampling technique was used to include a total of 400 participants in the study.

Data were collected through a questionnaire specially designed for the study. The study questionnaire was piloted on 10% of sample size to check for reliability and face validity. The value of Cronbach's alpha achieved was 0.847 indicating a good level of interval consistency whereas the respondents were questioned if the questionnaire appeared to have assessed their awareness regarding low birth weight to determine its face validity.

The study questionnaire consisted of two sections. The first section had six questions on demographic characteristics such as age, respondent's and husband's education level, monthly household income, type of family and parity of the respondent. The second section contained twenty three awareness questions regarding the factors associated with low birth weight. The data collection was started after taking written informed consent from participants. The study questionnaire was filled by the principal investigator. At the time of data entry, all correct responses of the participants were given a score of 1 whereas the incorrect responses were given a score of 0. Participants with 17 or more correct responses out of total 23, i.e. 70%, were deemed to have adequate awareness regarding low birth weight.

Data were entered and analyzed on SPSS version 21. For descriptive analysis, frequencies and percentages were generated for categorical variables whereas means and standard deviation were calculated for continuous variables. Inferential analysis was performed by applying binary logistic regression to develop a risk assessment model for the study outcome. The significance level was kept at 0.05.

RESULTS

A total of 400 participants were included in the study. The mean age of the participants was 30.79±6.00 years, 208 (52.0%) of them were aged up to 30 years, 99 (24.8%) of them were illiterate whereas 104 (26.0%) of them had secondary education, 149 (37.3%) of the husbands had secondary whereas 106 (26.5%) of them had intermediate or above education, 243(60.8%) of the respondents had a monthly household income of 20,000-50,000 rupees, 206 (51.5%) of them lived in a nuclear family, 174 (43.5%) of them were multipara whereas 105 (26.3%) of them were primipara (table 1).

Table 1: Participants Profile

Participant Characteristics (n=400)	Mean±SD/Count (%)
Maternal Age (Years)	30.79±6.00
Maternal Age Group	
Up to 30 Years	208 (52.0)
More than 30 years	192 (48.0)
Maternal Education	
Illiterate	99 (24.8)
Able to read and write	39 (9.8)
Primary	68 (17.0)
Secondary	104 (26.0)
Intermediate and above	61 (15.3)
Religious education only	29 (7.3)
Husband Education	
Illiterate.	52 (13.0)
Able to read and write	18 (4.5)
Primary	55 (13.8)
Secondary	149 (37.3)
Intermediate and above	106 (26.5)
Religious education only	20 (5.0)
Monthly Household Income (Rupees)	
<20,000	67(16.8)
20,000-50,000	243 (60.8)
>50,000	90 (22.5)
Type of Family	
Nuclear	206 (51.5)
Joint	194 (48.5)
Parity	
Nulliparous	57 (14.3)
Primiparous	105 (26.3)
Multiparous	174 (43.5)
Grand Multiparous	64 (16.0)

Moreover, the study results showed 210 (52.5%) respondents were aware that maternal hypertension is a risk factor for low birth weight, 239 (59.8%) were aware that smoking is a risk factor for low birth weight whereas 230 (57.5%) were aware that maternal ill health can affect child's growth. Moreover, 230 (57.5%) respondents were aware that iron supplementation, 234 (58.5%) were aware that folic acid supplementation whereas 219 (54.8%) were aware that iodine supplementation during pregnancy improves birth weight. Also, 229 (57.3%) respondents were aware that maternal hypoglycaemia can contribute to low birth weight, 234 (58.5%) were aware that inadequate maternal food intake can lead to low birth weight whereas 224 (56.0%) were aware that insufficient rest taken by a mother during pregnancy can affect baby weight. Furthermore, 214 (53.5%) respondents were aware that adolescent pregnancies can lead to low birth weight, 197 (49.3%) were aware that multiple child births can lead to low birth weight, 217 (54.3%) were aware that failure to receive antenatal care can result in low birth weight, 224 (56.0%) were aware that doing heavy work during pregnancy can lead to low birth weight, 283

(58.3%) were aware that emotional stress during pregnancy can result in low birth weight whereas 233 (58.3%) were aware that pre-term birth can lead to low birth weight (table 2).

Table 2: Awareness assessment regarding Low Birth Weight

Questions assessing Awareness (n=400)	Correct Response
	Count (%)
Do you know about low birth weight?	257 (64.3)
Is maternal anemia a risk factor for low birth weight?	256 (64.0)
Not gaining weight regularly during pregnancy can lead to low birth weight?	249 (62.3)
Is maternal hypertension a risk factor for low birth weight?	210 (52.5)
Is smoking a risk factor for low birth weight?	239 (59.8)
Can maternal ill health affect baby growth?	230 (57.5)
Does iron supplementation during pregnancy improve birth weight?	230 (57.5)
Does folic acid supplementation during pregnancy improve birth weight?	234 (58.5)
Does iodine supplementation during pregnancy improve birth weight?	219 (54.8)
Does maternal hypoglycemia contribute to low birth weight?	229 (57.3)
Can maternal heart disease contribute to low birth weight?	251 (62.8)
Can maternal tuberculosis contribute to low birth weight?	222 (55.5)
Can maternal lung disease contribute to low birth weight?	206 (51.5)
Is recurrent diarrhea a risk factor for low birth weight?	214 (53.5)
Does inadequate maternal food intake lead to low birth weight?	234 (58.5)
Does insufficient rest by a mother during pregnancy affect baby weight?	224 (56.0)
Can adolescent pregnancy lead to low birth weight?	214 (53.5)
Can multiple child births lead to low birth weight?	197 (49.3)
Can failure to receive antenatal care result in low birth weight?	217 (54.3)
Does heavy work during pregnancy lead to low birth weight?	224 (56.0)
Can emotional stress result in low birth weight?	283 (58.3)
Can pre-term birth lead to low birth weight?	233 (58.3)
Does low birth weight baby suffer from malnutrition?	224 (56.0)

It was further seen that 284 (71.0%) respondents had inadequate awareness regarding low birth weight (figure 1).

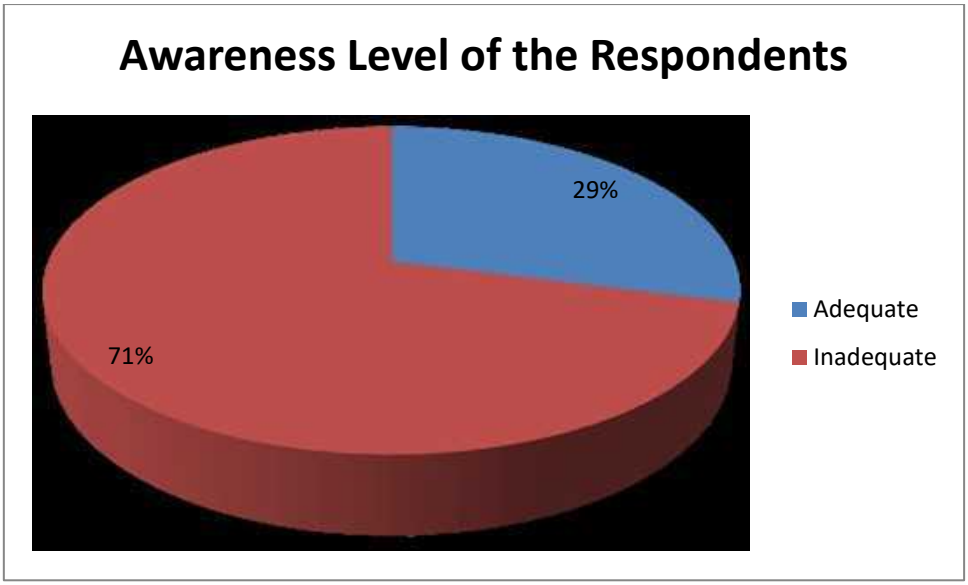

Figure 1: Awareness Level of the Respondents

Multivariable analysis of association between participant characteristics and their awareness level revealed that maternal education was significantly associated with the awareness level where participants with primary or secondary education had significantly higher odds of having adequate awareness regarding low birth weight than those who were illiterate (AOR=2.52, 95% CI 1.01-6.27, p=0.046 and AOR=6.99, 95% CI 2.94-16.63, p<0.001 respectively) (table 3).

Table 3: Multivariable Analysis of Association between Participant Characteristics and Awareness Level

Participants Characteristics (n=400)	AOR	95% CI		p
		Lower	Upper	
Maternal Age (Years)				
Up to 30 Years	1.35	0.75	2.43	0.304
More than 30 years	**Ref**			
Maternal Education				
Illiterate	**Ref**			
Able to read and write	0.44	0.10	1.80	0.256
Primary	2.52	1.01	6.27	0.046
Secondary	6.99	2.94	16.63	<0.001
Intermediate and above	0.91	0.28	2.92	0.877
Religious education only	0.61	0.12	2.94	0.543
Husband Education				
Illiterate	**Ref**			
Able to read and write	1.74	0.37	8.02	0.478
Primary	1.15	0.37	3.58	0.803
Secondary	0.92	0.31	2.70	0.883
Intermediate and above	2.42	0.74	7.95	0.143
Religious education only	0.29	0.02	3.41	0.329
Monthly Household Income (Rupees)				

<20,000	**Ref**			
20,000-50,000	0.87	0.40	1.88	0.732
>50,000	1.37	0.54	3.47	0.500
Type of Family				
Nuclear	**Ref**			
Joint	1.44	0.85	2.42	0.166
Parity				
Nulliparous	1.36	0.51	3.6	0.530
Primiparous	0.64	0.25	1.62	0.357
Multiparous	1.49	0.68	3.25	0.316
Grand Multiparous	**Ref**			

DISCUSSION

The study results showed that 64.3% respondents were aware about low birth weight. Likewise, a previous study reported 67.8% respondents to have good knowledge about low birth weight.[12] This finding shows that a good majority of females of reproductive age have awareness about low birth weight which hopefully will shape better attitudes and translate into meaningful practices that can ensure better health of their children.

According to literature, maternal anaemia is considered a risk factor for low birth weight.[13] The study results showed that 64.0% of respondents were aware that maternal anaemia is a risk factor for having children with low birth weight. An earlier study from Bangladesh reported this percentage to be 40.0%.[14] This is a welcome finding that shows that an increasing percentage of future mothers are aware that being anaemic can affect the well-being of their children and thus can be expected to be more compliant towards any counselling or treatment that their doctor might have offered them for its management.

A recent secondary data analysis including data from Pakistan reported that hypertensive disorders in mothers were significantly associated with a greater risk of low birth weight [RR 2.74 (95% CI - 1.21-1.33].[15] Only 52.5% respondents in this study were aware that maternal hypertension is a risk factor for low birth weight of their children. Similarly, an earlier study reported 46.0% of participants to have this awarenss.[12] Hypertension in pregnancy is a very serious medical condition that may endanger the life of both the mother and the baby. This low percentage points out towards the need of increased efforts on part of all stakeholders to enhance mothers' awareness about this important health condition.

Almost 60% of respondents in this study were aware that smoking is a risk factor for low birth weight. Likewise, an earlier study reported 63.8% of respondents to have this awareness.[12] This awareness percentage is far from satisfactory given the prevalence of smoking in our societies. This again calls for focused awareness campaigns highlighting the risks associated with smoking for a new born.

A recent study reported poor maternal general health as a predictor of poor health in infants.[16] In this study, only 57.5% participants were aware that maternal ill health can affect baby growth. This finding was quite disturbing as a mother who is not aware that her physical and mental fitness is crucial for her child's well-being can easily overlook the necessity of maintaining her own health for the sake of her child.

The role of iron and folic acid supplementation in pregnancy is well established and is vital for avoiding low birth weight in a child. A recent study from India reported that iron and folic acid supplementation is significantly associated with reduction in odds of low-birth-weight when it is consumed for more than 3 months.[17] It was found that only 57.5% study participants were aware that iron whereas only 58.5% were aware that folic acid intake during pregnancy improve birth weight. An earlier study from Ethiopia reported that only 15.9% of respondents were aware about the significance of preconception intake of folic acid.[18] These findings highlight the need of redoubling the efforts to improve mothers' awareness regarding this critical aspect of their awareness related to low birth weight.

Furthermore, only 54.8% participants were aware that iodine intake during pregnancy improves birth weight. An earlier study reported 74% of the pregnant women to have low awareness regarding iodine supplementation.[19] Like iron and folic acid supplementation, adequate iodine intake during pregnancy is also critical. Such low awareness percentage among females of reproductive age about iodine supplementation is a worrisome sign and demands action on part of all stakeholders.

Moreover, only 58.5% respondents were aware that inadequate maternal food intake can lead to low birth weight, unlike an earlier study from Bangladesh, where 83.6% respondents had such knowledge.[12] This finding highlights the need to educate our mothers about the importance of a proper diet for ensuring the well-being of their children.

It was further seen that only 56.0% respondents were aware that insufficient rest taken by a mother during pregnancy can affect baby weight. An earlier study from Bangladesh reported 73.2% respondents to have this awareness.[12] This highlights the importance of educating mothers on maternal self-care, including adequate rest in order to promote healthy pregnancies and healthy birth outcomes in our population.

A recent secondary data analysis including data from Pakistan reported that maternal age under 20 years was significantly associated with a greater risk of low birth weight [RR 1.41 (95% CI 1.32-1.49).[15] Likewise, another recent study found teenage pregnancy to be significantly associated with low birth weight.[20] In this study, only 53.5% of respondents were aware that adolescent pregnancies can lead to low birth weight. An earlier study from Bangladesh though reported that 83.3% of the respondents were aware that adolescent marriages should be avoided to prevent low birth weight in children.[12] This shows that the awareness level of our local population is not satisfactory on this important and common societal problem and highlights the importance of continuing efforts to educate and raise awareness about the potential risks and complications associated with adolescent pregnancies.

Disturbingly, only 49.3% respondents were aware that multiple child births can lead to low birth weight. An earlier study from Bangladesh though reported this percentage to be 76.0%.[12] This difference in the awareness percentages between the two studies could be due to various factors, such as the sample population being different, variability in the methods of data collection, or the time frame of the studies.

Furthermore, only 54.3% of respondents were aware that failure to receive antenatal care can result in low birth weight. Two earlier studies though reported this percentage to be 66.1% and less than 20%.[12, 14] A recent secondary data analysis including data from Pakistan reported that 1 to 3 antenatal visits were significantly associated with a higher low birth weight risk than four or more visits [RR 1.68 (95% CI 1.55–1.83).[15] Another recent multi-country study reported that only 52.8% Pakistani women attend three or more antenatal care visits.[21] Access to antenatal care vary depending upon the location, socio-economic status, and various other factors, which could also affect the awareness and understanding of the participants. Our finding potentially reflects that awareness regarding this very important aspect of pregnancy varies widely among populations and is probably quite low in our local setting.

Alarmingly, 71.0% of study respondents were found to have inadequate awareness regarding low birth weight and its associated factors. Such a high percentage of women without adequate awareness is quite a worrisome finding. A woman with insufficient awareness regarding low birth weight is less likely to seek any medical advice to deal with the potential causes of low birth weight. It is therefore fundamental that women of reproductive age are given the necessary relevant awareness in order to better equip them to avoid the factors associated with low birth weight.

Maternal age was not found to be significantly associated with the awareness level regarding low birth weight in this study, though an earlier study reported contrasted findings.[14]It can be argued that an aged mother may have a greater experience with child care due to her older offspring and thus may have a better understanding of the factors that may lead to low birth weight in a child. More studies are recommended to further explore this interesting relationship.

Literature reports that low maternal education is significantly associated with low birth weight.[22] In this study, higher maternal education was found to be significantly associated with their better awareness level.

Likewise, two earlier studies also reported maternal education to be significantly associated with their awareness regarding low birth weight.[12, 14] It can be reasonably argued that with an increase in education level, the chances of having a better awareness regarding any particular subject of interest also increases, and thus these results were not unexpected.

Meanwhile, there was no significant association between monthly household income and awareness level of mothers in this study. A greater earning is not a guarantee of higher education and better knowledge in an individual. Further research is nevertheless needed to draw a meaningful conclusion about this relationship.

It is acknowledged that being a single centre study, the generalizability of study findings is limited. Moreover, as this study used a cross-section design, a cause and effect relationship between participant characteristics and their awareness level could not be established.

CONCLUSION

More than two-thirds of study respondents had inadequate awareness regarding low birth weight and its associated factors. Moreover, the education level of mothers was found to have a significant association with their awareness level.

Based upon the study findings, it is recommended that specific targeted interventions are needed to enhance awareness of women of reproductive age in our society regarding the factors affecting low birth weight. These interventions can take the form of media campaigns, public seminars or community meetings.

Acknowledgement: None

Disclaimer: This was the thesis of Masters in Public Health of Niamat Rahim

Conflict of interest: The authors do not report any conflict of interest

Funding disclosure: None

Authors contributions

Niamat Rahim contributed to the conceptualization of the study, literature review, and initial drafting of the manuscript.

Syed Nauman Raza was involved in study design, data interpretation, and critical revision of the manuscript for important intellectual content.

Syed Muhammad Zulfiqar Hyder Naqvi supervised the research process, and approved the final version of the manuscript for submission.

Sabika Jaffer assisted in data collection, literature search, and manuscript editing.

Nazia Jameel contributed to statistical support, results interpretation, and formatting of the manuscript according to journal guidelines.

Ambreen Afridi contributed to methodology development, data analysis, coordinated among authors, and review of the final manuscript.

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