

A CROSS SECTIONAL STUDY ON AWARENESS OF RISK FACTORS OF MATERNAL OBESITY AMONG WOMEN IN A TERTIARY CARE HOSPITAL IN CHENNAI, TAMIL NADU

Abstract

Background There has been a rise in prevalence of obesity all around the world. Obesity during pregnancy has various adverse outcomes on both the child and mother. Maternal affects include pregnancy induced hypertension, gestational Diabetes, pre-eclampsia and foetal outcomes includes macrosomia, pre term birth and obstructed labour. **Aim** of this study is to assess the knowledge and awareness of complications of obesity during pregnancy among women. **Materials and methods** This is a cross sectional descriptive questionnaire study conducted among 384 women attending the out-patient's department of obstetrics and gynaecology during a time period of January 2021 to June 2021. **Results** Average level of awareness was found among the participants. 53.3% women were aware and 46.6% participants were not aware of the adverse effects of maternal obesity. **Conclusion** In this study, it was observed that half of the participants were unaware, hence perinatal counselling and awareness camps needs to be conducted to raise the awareness and knowledge levels among general population for a healthier society.

Key words: maternal obesity, pre-eclampsia, gestational diabetes, BMI, premature birth

Introduction

There has been an increasing prevalence of maternal obesity across the world, which has become a major health concern^[1]. Maternal obesity is said to have both maternal and foetal complications. In case of mothers, it causes various complications during their pregnancy such as hypertension, preeclampsia and gestational diabetes^[2]. If there is excessive weight gain during pregnancy and postpartum retention of weight gain, it results in higher chances of having obesity later on in life and having further complications^[3]. It has also been noted that the relationship between poor lactation performance and high body

mass index is of high concern because of the increase in incidence of obesity among young females ^[4]. A lot of studies, from various populations, it has been reported that there is a very strong relationship between low rates of lactation, early termination of lactation and maternal overweight ^[4]. It has also been noted from various studies that obesity in early childhood leads to severe adult obesity ^[5]. And hence childhood obesity is considered as the recent epidemic because of the emergence of these junk foods and fast lifestyle.

Adequate lifestyle interventions which include behavioural counselling related to importance of healthy diet and physical exercise has always shown positive outcome in controlling gestational weight gain ^[6].

This study was conducted in order to increase the awareness of people in rural areas of southern part of India about maternal obesity and its various complications.

Materials and Methods

A cross sectional study was conducted among antenatal women attending the outpatient department of obstetrics and gynaecology in a tertiary care hospital in Chennai, Tamil Nadu during a time period of January 2021 to June 2021. All the women predominantly belonging to an age group of 18 to 50 years. Sample size was calculated based on a study done by Nneka et al, which showed that 40.2% of study participants were aware of complications of obesity in pregnancy ^[7]. Using the formula $4pq/d^2$ and considering 5% allowable error, the sample size was calculated to be 384. The study was conducted after obtaining a written informed consent in their native language, Tamil. All women who gave consent was interviewed personally in the OP room. Women who belonged to third trimester and who were anxious about the study and who did not give consent for the study was excluded from this study.

This study is a cross sectional survey which had two questionnaires. Part 1 included a pre tested and structured questionnaire consisting of their sociodemographic details (age, religion, type of family, education, occupation, total number of family members, per capita income, socioeconomic class and parity) and part 2 consists of a structured and validated questionnaire to assess the knowledge, awareness and perception about complications of maternal

obesity^[8].The questionnaire was translated into native language and explained well to the participants before collection of data.

The data entry was done in Microsoft Excel Sheet and data was analysed using SPSS software version 22. Frequencies and percentages were calculated. Chi square test was done to find association

Ethical clearance

The study was approved by institutional ethics committee of Saveetha Medical College, Chennai, Tamil Nadu.

Results

Table 1 – Participant’s awareness and knowledge about complications of maternal obesity

s.no	questionnaire	Responsesn (%)
1	Are you aware of obesity in pregnancy and its risk before?	

	1.Yes	205(53.3%)
	2.no	179(46.6%)
2	What is the source of information?	
	1.Health professionals	53(13.8%)
	2.social media	39(10.1%)
	3.Magazine, newspaper & online website	36(9.3%)
	4.Friends, relative & family	77(20.05%)
	5. don't know	179(46.6%)
3	Do you think obesity during pregnancy can affect mother or foetus	
	1. mother	47(12.23%)
	2. foetus	35(9.11%)
	3. Both mother & foetus	114 (29.66%)
	4. don't know	188 (48.95%)
4	What do you think are the complications of obesity during pregnancy?	
	1.Premature birth	29(7.55%)
	2. Obstructed labour	20(5.20%)
	3. shoulder dystocia in new born	22(5.72%)
	4. All of the above	66(17.18%)
	5. don't know	247(64.32%)
5	In your opinion do you think maternal obesity can increase the risk of foetal birth defects?	
	1.yes	39 (10.1%)
	2.no	33 (8.6%)
	3.maybe	86(22.39%)
	4.Don't know	226(58.35%)
6	What do you think about chance of developing diabetes mellitus at young age if mother is diagnosed with mother is diagnosed with maternal obesity?	
	1.yes	42(10.99%)
	2.no	36(9.3%)
	3.maybe	80(20.83%)
	4.Don't know	226(58.85%)
7	In your opinion what are the preventive measures to reduce the risk of maternal obesity?	
	1.Walking daily and adequate physical exercise	54(14.06%)
	2.Healthy food consumption	47(12.23%)
	3.regular checkup	20(5.2%)
	3.All of the above	78(20.31%)
	4.I don't know	185(48.17%)

Table 2–Association of educational qualification of participants and their knowledge levels about obesity and its adverse outcomes during pregnancy

s.no	questionnaire	responses				P<0.05
		illiterate	Primary education	Secondary education	professional	
1	Are you aware of obesity in pregnancy and its risk before?					0.223
	1.Yes	2	8	125	70	
	2.no	6	29	128	16	
2	What is the source of information?					0.312
	1.Health professionals	0	3	30	20	
	2.social media	0	1	29	9	
	3.Magazine, newspaper & online website	0	0	22	14	
	4.Friends, relative & family	2	4	44	27	
	5. don't know	6	29	128	16	
3	Do you think obesity during pregnancy can affect mother or foetus					0.123
	1. mother	1	2	31	13	
	2. foetus	0	1	23	11	
	3. Both mother & foetus	0	3	66	45	
	4. don't know	7	31	133	17	
4	What do you think are the complications of obesity during pregnancy?					0.223
	1.Premature birth	0	0	12	17	
	2. Obstructed labour	0	0	8	12	
	3. shoulder dystocia in new born	0	0	17	5	
	4. All of the above	0	5	36	25	
	5. don't know	8	32	180	27	
5	In your opinion do you think maternal obesity can increase the risk of foetal birth defects?					0.009
	1.yes	0	0	28	11	
	2.no	0	2	22	9	
	3.maybe	0	6	46	34	
	4.Don't know	8	29	157	32	
6	What do you think about chance of developing diabetes mellitus at young age if mother is diagnosed with mother is diagnosed with maternal obesity?					0.214
	1.yes	0	0	28	14	
	2.no	0	7	22	7	
	3.maybe	0	1	46	33	
	4.Don't know	8	29	157	32	
7	In your opinion what are the preventive measures to reduce the risk of maternal obesity?					0.006
	1.Walking daily and adequate physical exercise	0	1	33	20	
	2.Healthy food consumption	2	2	29	14	
	3.regular check-up	0	1	10	9	
	4.All of the above	0	4	48	26	
	5.I don't know	6	29	133	17	

Table 3– Association of socioeconomic class and awareness responses among participants

s.no	questionnaire	responses			P<0.05
		Lower class	Middle class	Upper class	
1	Are you aware of obesity in pregnancy and its risk before?				0.005
	1.Yes	20	165	20	
	2.no	47	119	13	
2	What is the source of information?				0.001
	1.Health professionals	2	34	17	
	2.social media	4	35	0	
	3.Magazine, newspaper & online website	0	34	2	
	4.Friends, relative & family	14	62	1	
	5. don't know	47	119	13	
3	Do you think obesity during pregnancy can affect mother or foetus				0.222
	1. mother	8	37	2	
	2. foetus	4	29	2	
	3. Both mother & foetus	8	90	16	
	4. don't know	47	128	13	
4	What do you think are the complications of obesity during pregnancy?				0.653
	1.Premature birth	3	24	2	
	2. Obstructed labour	4	14	2	
	3. shoulder dystocia in new born	0	18	4	
	4. All of the above	7	48	11	
	5. don't know	53	180	14	
5	In your opinion do you think maternal obesity can increase the risk of foetal birth defects?				0.819
	1.yes	6	29	4	
	2.no	4	27	2	
	3.maybe	7	65	14	
	4.Don't know	50	163	13	
6	What do you think about chance of developing diabetes mellitus at young age if mother is diagnosed with mother is diagnosed with maternal obesity?				0.233
	1.yes	6	29	4	
	2.no	4	27	2	
	3.maybe	7	59	14	
	4.Don't know	50	169	13	
7	In your opinion what are the preventive measures to reduce the risk of maternal obesity?				0,001
	1.Walking daily and adequate physical exercise	4	36	14	
	2.Healthy food consumption	1	42	4	
	3.regular check-up	1	16	3	
	3.All of the above	1	76	1	
	4.I don't know	50	112	13	

Table 4 – Association of parity and awareness response among participants

s.no	questionnaire	responses		P<0.05
		Primi gravida	multiparous	
1	Are you aware of obesity in pregnancy and its risk before?			0.002
	1.Yes	60	145	
	2.no	63	116	
2	What is the source of information?			0.297
	1.Health professionals	18	35	
	2.social media	6	33	
	3.Magazine, newspaper & online website	4	32	
	4.Friends, relative & family	32	45	
	5. don't know	63	117	
3	Do you think obesity during pregnancy can affect mother or foetus			0.083
	1. mother	5	42	
	2. foetus	4	31	
	3. Both mother & foetus	44	70	
	4. don't know	70	118	
4	What do you think are the complications of obesity during pregnancy?			0.768
	1.Premature birth	6	23	
	2. Obstructed labour	3	17	
	3. shoulder dystocia in new born	8	14	
	4. All of the above	28	38	
	5. don't know	78	169	
5	In your opinion do you think maternal obesity can increase the risk of foetal birth defects?			0.926
	1.yes	9	30	
	2.no	8	25	
	3.maybe	40	46	
	4.Don't know	66	160	
6	What do you think about chance of developing diabetes mellitus at young age if mother is diagnosed with mother is diagnosed with maternal obesity?			0.104
	1.yes	12	30	
	2.no	9	27	
	3.maybe	38	42	
	4.Don't know	64	162	
7	In your opinion what are the preventive measures to reduce the risk of maternal obesity?			0.766
	1.Walking daily and adequate physical exercise	12	42	
	2.Healthy food consumption	8	39	
	3.regular check-up	4	16	
	4.All of the above	4	48	
	5.I don't know	69	116	

Table 1 summarizes participants awareness and knowledge about complications of maternal obesity. 205(53.3%) and women are aware of the same and 179(46.6%) participants were found to be unaware of the term obesity and its adverse effects.

Table 2,3,4 summarized the association of socioeconomic class, education levels and parity with the knowledge and awareness of obesity during pregnancy and its adverse outcomes.

Discussion

Maternal obesity increases the risk of adverse outcomes for both mother and the child ^[9]. In various studies conducted in the Middle eastern countries it was observed that more than half of its participants were obese /overweight and it might be due to poor knowledge about maternal obesity and its adverse outcomes ^[10,11]. In a study conducted in Saudi Arabia 68.5% mothers had poor awareness about maternal obesity whereas in our study 46.6% women were not aware of adverse outcomes of maternal obesity ^[9]. Lack of knowledge and awareness can most likely be due to the low education level among women. As in our study it shows women who at least completed secondary education or have a professional degree are more likely to be more aware of complications of maternal obesity than those who are illiterate or who had only primary education. This is similar to the result obtained by Dekker et al ^[12].

The various maternal outcomes of obesity during pregnancy are increased risk of pregnancy induced hypertension, gestational diabetes and more chances of having a caesarean section. Post-dated baby, macrosomia, low APGAR score and prolonged hospitalisation are the various effects of maternal obesity on the babies ^[13]. In a study which was conducted in Scotland it was reported that obesity during pregnancy was associated with an increased risk of developing type 2 Diabetes Mellitus among offspring ^[14]. There was a strong association between increased chances of developing childhood obesity and obesity during pregnancy ^[15]. Even though all the previously mentioned studies reported various adverse outcomes of maternal obesity not much studies were conducted on awareness of the general population about the same.

In our study 46.6% women reported that they were not aware of maternal obesity and its complications and the associated factors involved are educational qualification, socioeconomic class and the parity of the mother. This result was somewhat similar to the results obtained in a study conducted in Saudi wherein participants with at least a bachelor's degree were more aware than the rest of participants hence proving the direct relationship between level of knowledge and education.

A better counselling and awareness of these adverse effects can motivate women to maintain appropriate BMI and improve the perinatal outcome.

Strengths of this study was its large sample size and it helped in assessing the awareness levels in a wide range of women.

Limitations of this study- more research in diverse locations nationwide is required to confirm the findings. The result obtained in our result varies from other studies maybe because of sociocultural differences.

Conclusion

The level of knowledge among women about complications of obesity during pregnancy in a sub urban area in south India was not found to be satisfactory. Hence health workers need to be trained to conduct awareness camps especially in the rural areas for all women of reproductive age group. Perinatal counselling also plays a very important role in improving knowledge among women. These awareness programs and counselling are very much the need of the hour because of increase in incidences of maternal obesity and and its awareness levels are quite low in the society.

References

1. Bautista-Castaño I, Henriquez-Sanchez P, Alemán-Pérez N, Garcia-Salvador JJ, Gonzalez-Quesada A, García-Hernández JA, Serra-Majem L. Maternal obesity in early pregnancy and risk of adverse outcomes. *PloS one*. 2013 Nov 20;8(11):e80410.
2. Tenenbaum-Gavish K, Hod M. Impact of maternal obesity on fetal health. *Fetal diagnosis and therapy*. 2013;34(1):1-7.
3. Leddy MA, Schulkin J, Power ML. Consequences of high incarceration rate and high obesity prevalence on the prison system. *Journal of Correctional Health Care*. 2009 Oct 1;15(4):318-27.
4. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. *Jama*. 2010 Jan 20;303(3):235-41.

5. Dietz WH. Overweight in childhood and adolescence. *New England Journal of Medicine*. 2004 Feb 26;350(9):855-7.
6. Skouteris H, Bailey C, Nagle C, Hauck Y, Bruce L, Morris H. Interventions designed to promote exclusive breastfeeding in high-income countries: a systematic review update. *Breastfeeding Medicine*. 2017 Dec 1;12(10):604-14.
7. Okeh NO, Hawkins KC, Butler W, Younis A. Knowledge and perception of risks and complications of maternal obesity during pregnancy. *GynecolObstet (Sunnyvale)*. 2015;5(323):2161-0932.
8. Alsubaie ZA, Al Hassan MY. Awareness of eastern region residents in Saudi Arabia about the hazards of maternal obesity and its association with offspring obesity and diabetes at early age.
9. Alshahrani MS, Alqahtani NS, Alqahtani AM, Almaqbul WN, Alwadei AM, Alzamanan SS, Salhi AA, Musallam SH, Almoqati SH, Alyami AR, Al-Hashan GM. Awareness of pregnant women about effect of obesity on mother and neonates at maternity and children's hospital, Najran, Saudi Arabia. *International Journal of Medical Science and Public Health*. 2018;7(4):322-8.
10. Wahabi H, Fayed A, Esmaeil S, Alzeidan R, Elawad M, Tabassum R, Hansoti S, Magzoup ME, Al-Kadri H, Elsherif E, Al-Mandil H. Riyadh mother and baby multicenter cohort study: the cohort profile. *PLoS One*. 2016 Mar 3;11(3):e0150297.
11. Meher-Un-Nisa MA, Ahmed SR, Rajab M, Kattea L. Impact of obesity on fetomaternal outcome in pregnant Saudi females. *International journal of health sciences*. 2009 Jul;3(2):187.
12. Nitert MD, Foxcroft KF, Lust K, Fagermo N, Lawlor DA, O'Callaghan M, Mcintyre HD, Callaway LK. Overweight and obesity knowledge prior to pregnancy: a survey study. *BMC pregnancy and childbirth*. 2011 Dec;11(1):1-8.
13. El-Gilany AH, Hammad S. Body mass index and obstetric outcomes in Saudi Arabia: a prospective cohort study. *Annals of Saudi medicine*. 2010 Sep;30(5):376-80.

14. Lahti-Pulkkinen M, Bhattacharya S, Wild SH, Lindsay RS, Räikkönen K, Norman JE, Bhattacharya S, Reynolds RM. Consequences of being overweight or obese during pregnancy on diabetes in the offspring: a record linkage study in Aberdeen, Scotland. *Diabetologia*. 2019 Aug;62(8):1412-9.
15. Heslehurst N, Vieira R, Akhter Z, Bailey H, Slack E, Ngongalah L, Pemu A, Rankin J. The association between maternal body mass index and child obesity: A systematic review and meta-analysis. *PLoS medicine*. 2019 Jun 11;16(6):e1002817.

UNDER PEER REVIEW