Relation between maternal body mass index and weight gain during pregnancy on anthropometric measurements of newborn

Nutrition is a key component affecting health throughout life.A significant relation was reported between women following a healthy diet before conception, during pregnancy and throughout the reproductive years and the effect on birth weight

Malnutrition, over weight leading to obesity or underweight leading to anemia is considered risk factors of pregnancy which usually cause pregnancy complications for example, neonatal deaths , low birth weight infants ,Prematurity ,and infant with congenital defects

The community health nurse as a nutritional counselor can increase the expectant women's knowledge about the function of the basic nutrients and metabolism, the selection of an adequate well balanced diet, the daily dietary recommendation and the alternative food patterns to promote their general and reproductive health and to reduce maternal and neonatal mortalities.

Aim of the study

The aim of the study is to identify the relation between maternal Body Mass Index and weight gain during pregnancy on anthropometric measurements of new born.

Research design

It is a prospective correlation study.

Setting

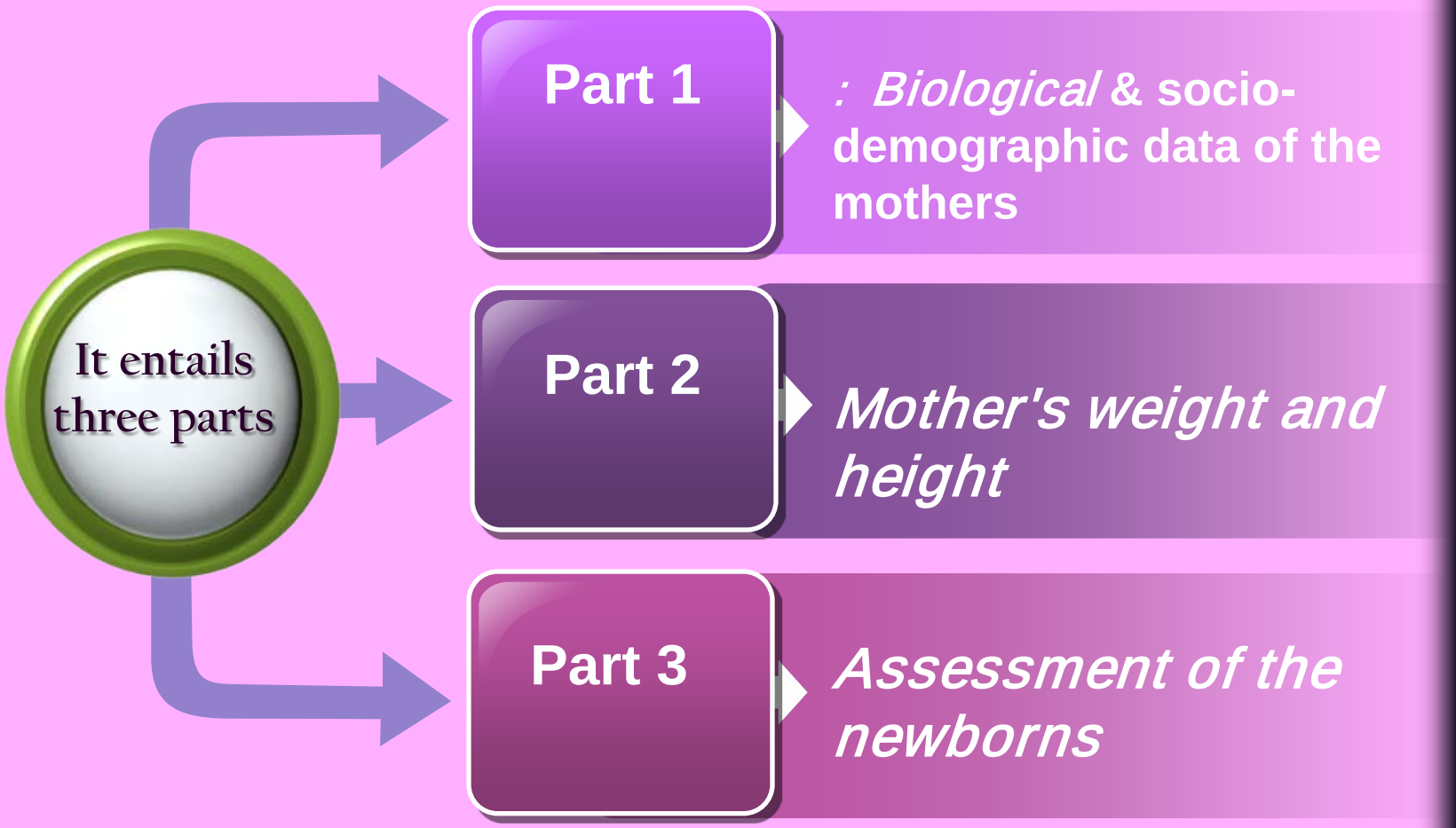
The study was conducted in the post partum section affiliated to three family health centers selected randomly from 7 zones of Alexandria namely: El. Montaza from EL-Montaza zone, Smouha from East zone and Abis10 from the Middle zone.

Subjects

All mothers attending the previously mentioned settings, for delivery and fulfilling the following criteria were included in the study; registered for antenatal care in the first trimester of pregnancy; know their pre-pregnancy body weight, free from any medical and obstetrical complications and single pregnancy.

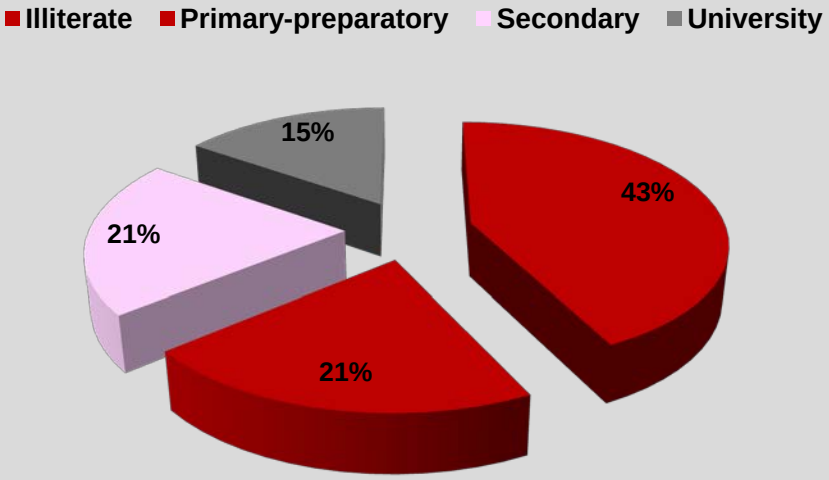
Their number amounted to 150 post partum women and their new born babies (fifty women and their early new born babies from each of the previously mentioned settings).

Tool: Mothers & newborn interview schedule

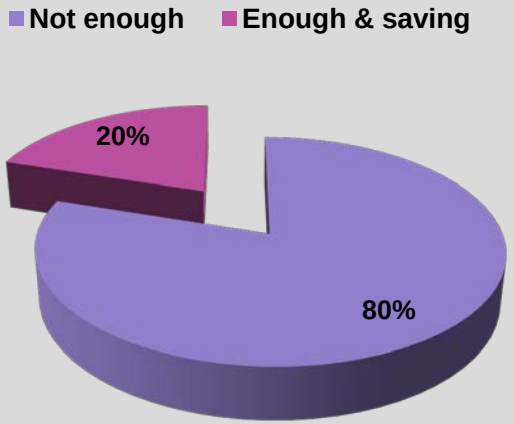


Distribution of the study subjects according to their socio-demographic characteristics

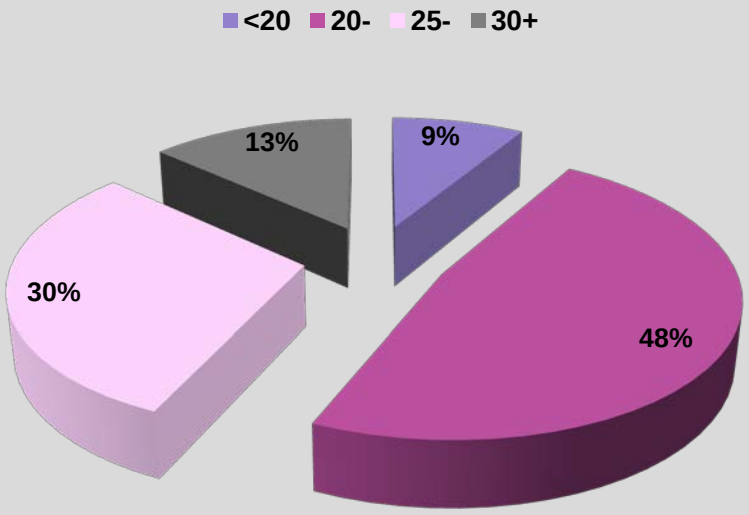
Education level



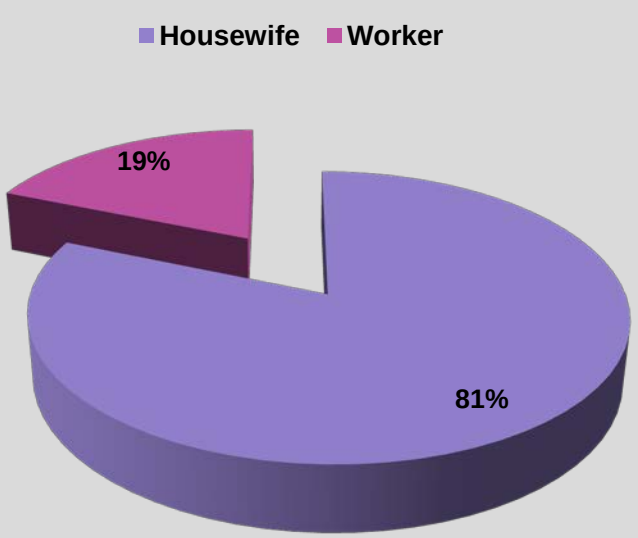
Income



Age in years

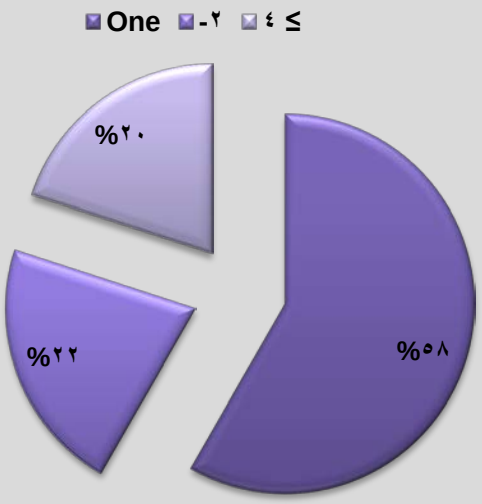


Occupation

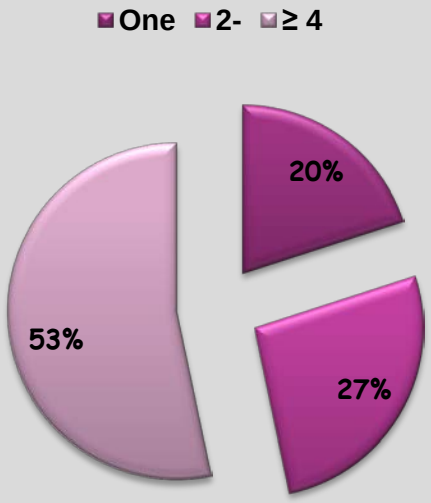


Distribution of the study subjects according to their reproductive history

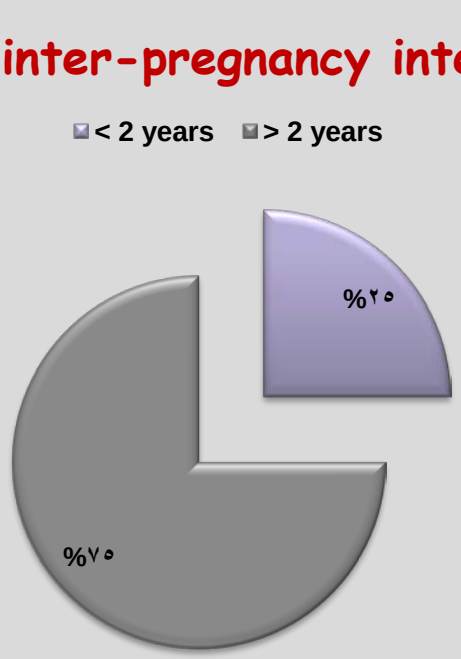
Parity



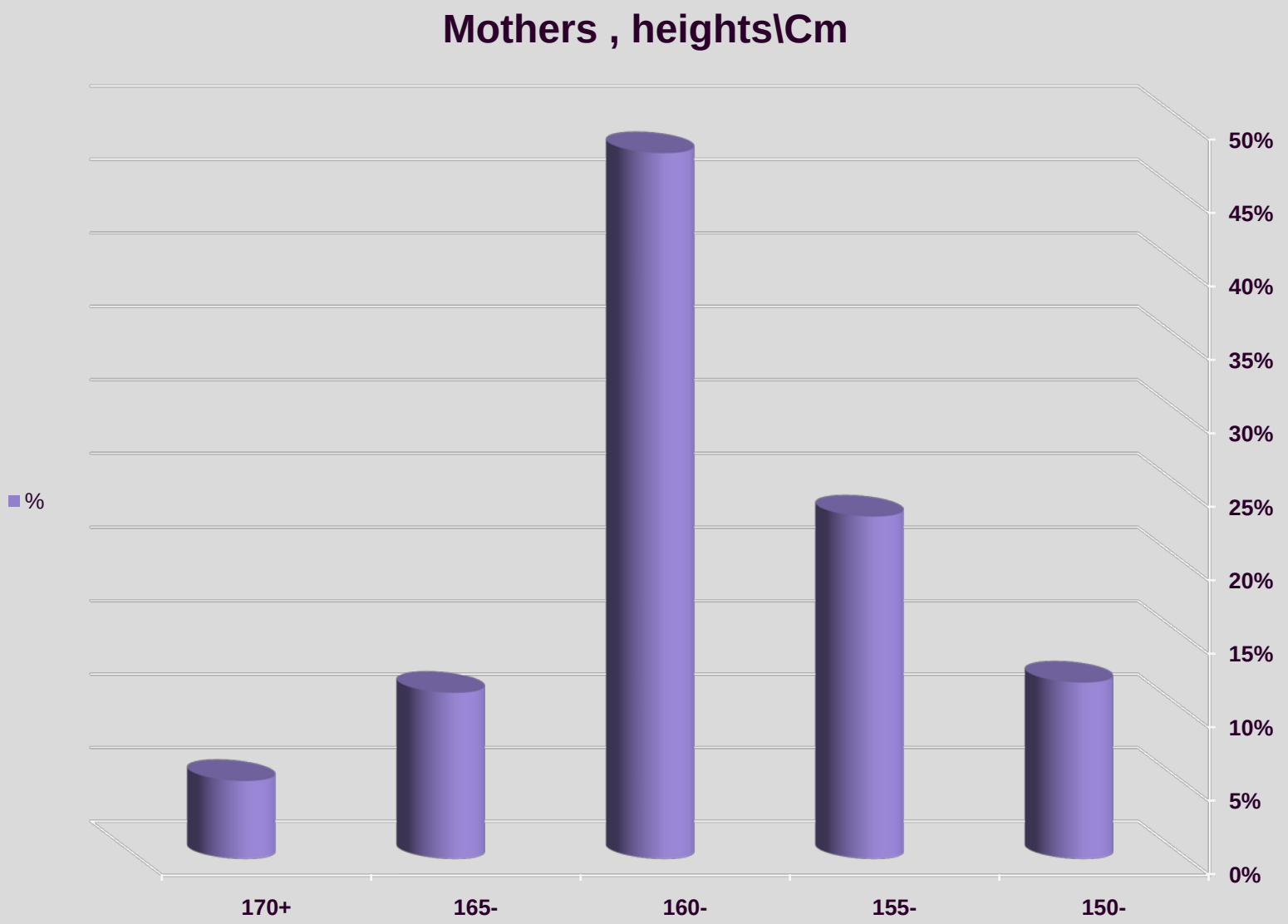
Gravity



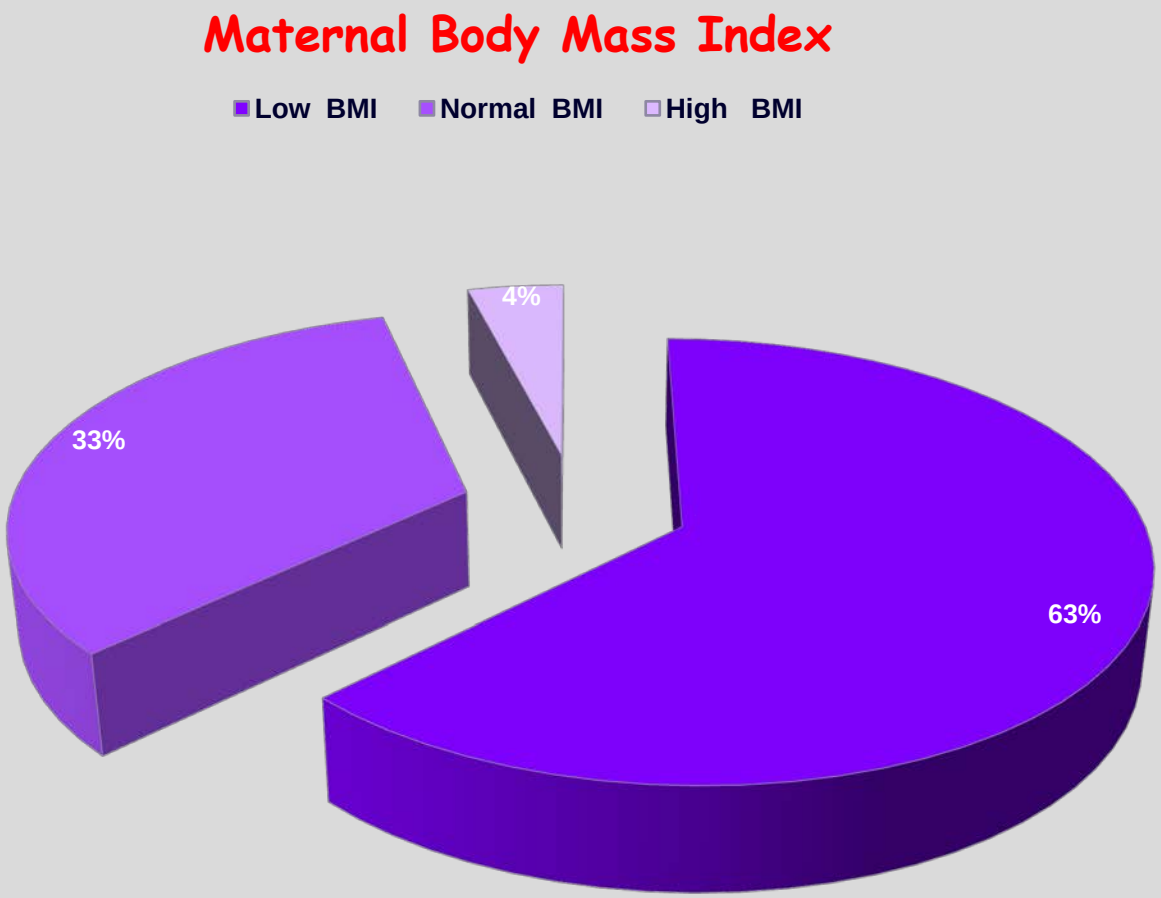
Last inter-pregnancy interval



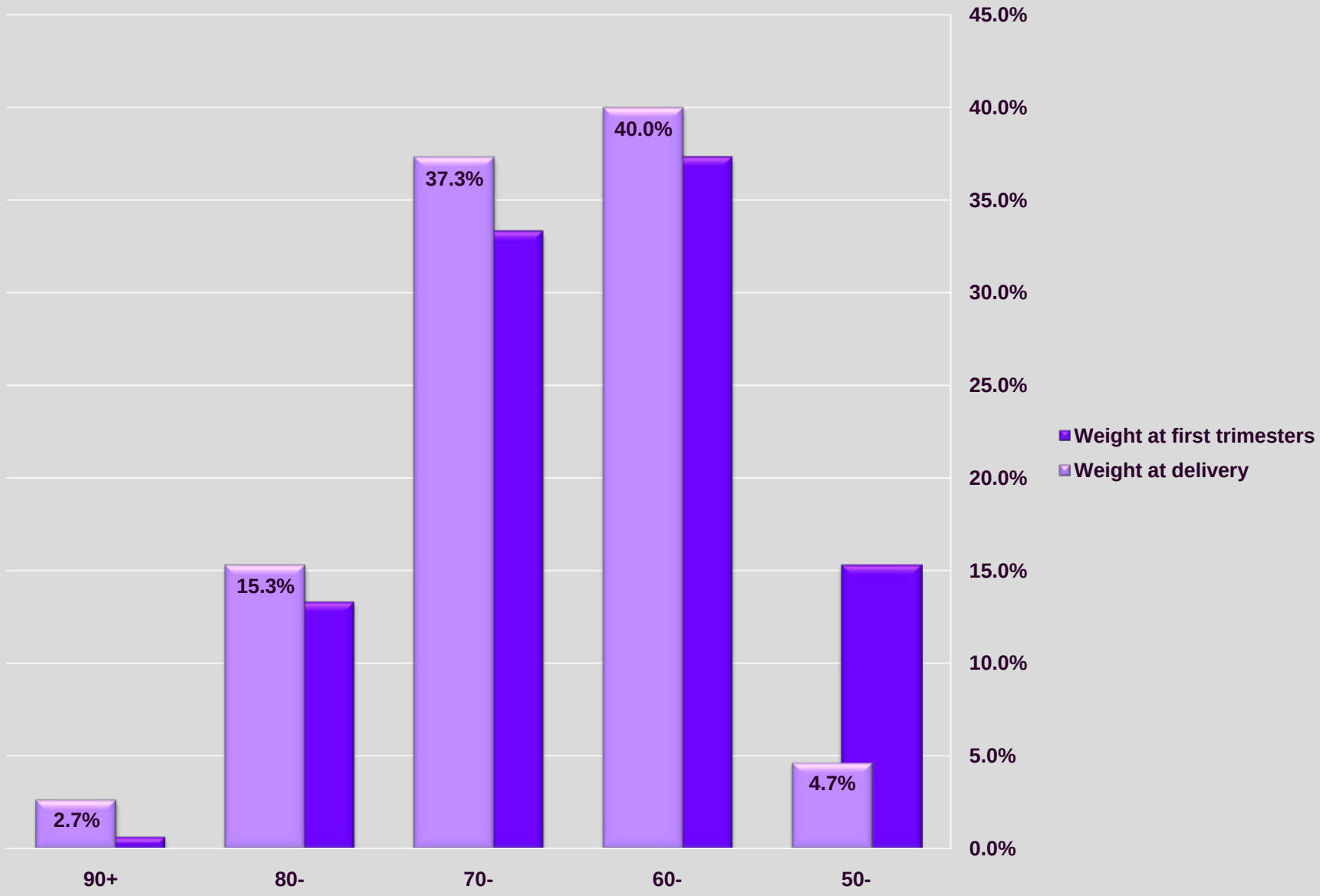
Distribution of the study mothers according to their height



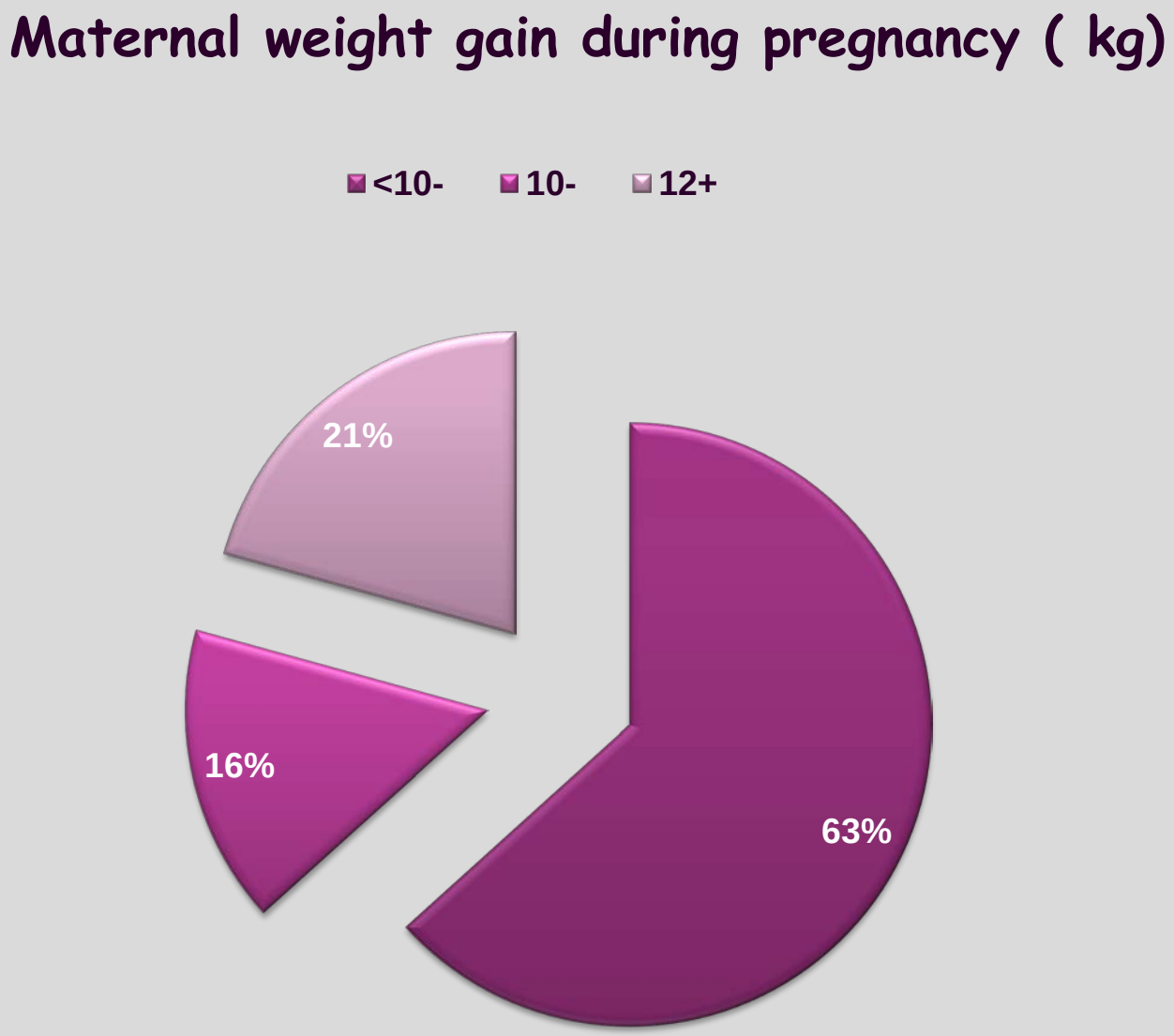
Distribution of the women according to their Body Mass Index (BMI) before pregnancy



Distribution of the study subjects according to their weight at first trimester of pregnancy and at delivery (kg)



Distribution of the study subjects according to their weight gain during pregnancy (kg).



Relation between maternal intake of vitamins, iron and their weight gain and level of hemoglobin during pregnancy

Maternal Intake of vitamins	Maternal Weight gain n=150		Maternal Hemoglobin level n=150	
	X	SD	Mean	SD
YES n=99	1٠.66	1.1547	12.61	1.04
NO n=51	9.18	1.86	10.97	1.61
Test of significant	t= 6.622 P= 0.005*		t=7.557 P= 0.034*	

P= significant at <0.05*

Distribution of the newborn according to their characteristics

Characteristics of newborn	N0.=150	%
(gestational age and anthropometric measurements).Gestational age (wks) •Low for gestational age (>37wks) •Full term baby (37-42wks)	 2 148	 1.33 98.67
Mean ± S.D	39.5±1.8708weeks	
Length(cm) •Low birth length (43-46cm) •Full term body (47-55 cm)	 21 129	 14.00 86.00
Mean ± S.D	49.45 ± 1.3089cm	
Weight (gm) •Low birth weight (1600-2450 gm) •Full term body (2500-4000 cm)	 51 99	 34.00 66.00
Mean ± S.D	2792.00 ± 751.51gm	
Head & chest circumference •Low birth of head circumference (30-32cm) •Full term body (33-35 cm)	 6 144	 4.00 96.00
Mean ± S.D	32.5 ± 1.8708cm	

Relation between maternal body mass index before pregnancy and birth weight of newborn

ITEMS	Birth weight n=150		Fisher exact test
	X	SD	
Maternal body mass index before pregnancy Low BMI < 19.8	2246.08	427.29	F= 6.5085 P = 0.03*
Normal BMI < 19.8-26	2586.26	438.70	
High BMI > 26.0-29	3600.00	241.01	

P= significant at <0.05*

Relation between maternal weight gain during pregnancy and birth weight of newborn

ITEMS	Birth weight n=150		Fisher exact test
	X	SD	
Maternal weight gain during pregnancy			
<10	2307.21	201.81	F= 6.5085
10-	2816.60	421.31	P = 0.03*
12+	3210.10	265.01	

P= significant at <0.05*

Relation between maternal body Mass index before pregnancy& weight gain during pregnancy and anthropometric measurements of the newborn

Items	Anthropometric measurements of newborn (n =150)							
	Weight of newborn		Length of newborn		Head Circumference		Chest circumference	
	r	p	r	p	R	p	r	p
Maternal body mass index before pregnancy	0.506	0.027*	0.560	0.013*	0.162	0.493	0.163	0.491
Maternal weight gain during pregnancy	0.605	0.005	0.682	0.001*	0.473	0.492	0.162	0.741

P= significant at <0.05*

Regression coefficient of the effect of maternal "factors" on birth weight of newborn

Maternal factors	Birth Weight of newborn n=150	
	(regression coefficient)	P
Age (year)		
< 20	**-0.035**	**0.355**
20-	**0.549**	**0.03***
>30	**0.487**	**0.04***
Parity		
Primipara	**0.601**	**0.03**
2	**0.682**	**0.04**
3-5	**0.610**	**0.03**
>5	**-0.067**	**0.10**
Education		
Illiterate & read & write	**-0.044**	**0.295**
Secondary & primary & preparatory	**0.311**	**0.04***
University level	**0.421**	**0.02***
Income		
Enough.	**0.1556**	**0.029***
Not enough.	**-0.030**	**0.355**

*P= significant at <0.05** *r.pearson cefficient*

Conclusion

- nutrition plays a key role in achieving an optimum outcome for mothers and babies. Low maternal weight gain during the first trimester of pregnancy as well as, inadequate weight gain throughout the pregnancy period is all associated with the delivery of low birth weight babies. Thus, weight gain during pregnancy may be the best predictor of the birth weight.

Recommendations

- Enforce good prenatal care with more emphasis on nutritional counseling, supplementation of iron and folic acid.

- Supplying MCH centers with adequate audiovisual materials to help nurses in health teaching about proper nutrition during pregnancy as well as antenatal care.

- Identifying high risk pregnant women and implement appropriate intervention. Beside conducting home visits to women with poor nutritional status during pregnancy.

- In service training programs should be carried out for nurses working in MCH centers to be able to determine nutritional problems during pregnancy.


Thank
YOU!