INTRODUCTION

Pregnancy is a gestational process comprising the growth and development within a woman's uterus of a fetus from conception through the embryonic and fetal period to birth. Pregnancy has approximately week's gestation from the day of fertilization, but it is considered to last weeks from the first day of last menstrual period. Pregnancy is known as normal process when medically uncomplicated low risk factors affect both mother and her pregnancy outcome. Whenever pregnancy is becoming of high risk the mother or her fetus has a significant increased risk of disabilities or death. Low and high risk pregnancy are probability for poor maternal and prenatal outcome ***(Anderson et al., 2012).***

A high risk pregnancy is one in which there are potential complications that could affect the mother, the baby or both.. high-risk pregnancies require management by a specialist to help ensure the best outcome for the mother and baby. A pregnancy can be considering a high –risk pregnancy for variety of reasons; Maternal age whether younger than age 15 years of age and older than the age of 35 years, weight (pre- pregnancy under weight or obesity), medical conditions that exist before pregnancy and medical condition that occur during pregnancy ***(American College of Obstetricians and Gynecologists, 2010).***

Obesity is one of the leading preventable causes of death worldwide. As the rates of women obesity increasing, authorities views obesity is one of the most serious public

health problems ofthe 21st century ***(Barness et al , 2007)***. The World Health Organization ***(WHO, 2011)*** predicts that overweight/ obesity may soon replace more traditional public health concerns such as under nutrition and infectious diseases as the most significant cause of poor health. Obesity in pregnancy is associated with various diseases with many complications, they have higher rate of early miscarriage and congenital anomalies, including neural tube defects. Besides preexisting diabetes mellitus and chronic hypertension increases the risk to thromboembolism, macrosomia, and spontaneous intrauterine demises in the latter half of pregnancy. Obese women also require instrument or Cesarean section delivery more often than average-weight women. Following Cesarean section delivery, they have a higher incidence of wound infection and disruption ***(Haslam and James, 2011)*.**

Obesity in pregnancy is usually defined as a Body Mass Index (BMI) of 30 kg/m^2 or more at the first antenatal consultation. BMI is a simple index of weight-for-height and is calculated by dividing a person's weight in kilograms by the square of their height in meters (kg/m^2). There are three different classes of obesity: BMI 30.0–34.9 (Class I); BMI 35.0–39.9 (Class 2); and BMI 40 and over (Class 3 or morbid obesity), class 1 and class 2 which recognize the continuous relationship between BMI and morbidity and mortality ***(Bureau, 2009 and USAID, 2009)*.**

Nutrition during pregnancy is important at all trimesters of pregnancy. Nutrition is one key to a successful pregnancy, adequate nutrition is vital both before and during pregnancy to

help ensure optimal health of both the fetus and the mother, organs and body parts in the offspring begins to develop very soon after conception. The first trimester is a critical period when inadequate nutrient intake or obesity can result in birth defect, during the second and third trimester, organs continue to mature, and very rapid growth occurs (***Moholdt et al ., 2011).***

The role of the CHN in Maternal and Child Health (MCH) centers is the prevention or reducing complications of obesity on pregnant women and her infant through the education program to help pregnant women comply with nutritional program throughout their pregnancy period. Also CHN roles include the collaboration with physician and deitatins in the screening, diagnosis, and management of the health problem of obesity during obesity ***(Allender and Spradly, 2011)***.

Extensive experience and training for the community health nurses (CHNs) are required to feel comfortable managing the care of women with obesity. By contrast, if good weight control can be achieved with diet, obesity confers a much lower risk for both the pregnant women and fetus. Now a day, changes in the health care system are increasingly responsibilities of professional nurses toward the area on health promotion. Nurses have an ideal opportunity to enhance health-promoting activities in order to reduce the risks of obesity during pregnancy; there are many roles that can practice by the CHN, as health promoter to prevent obesity in pregnancy ***(Stanhop and Poston, 2011).***

Prevention strategies include good monitoring through good screening to risky group and for all pregnant women especially those who have risk factors for obesity, early diagnosis and education programs, early registration to the antenatal clinic; good health education should be started as early as possible to identify risk factors that may develop as consequences of obesity ***(USAID, 2009)***.

SIGNIFICANCE OF THE STUDY

Obesity of maternal is one of major health problems encountering health of the pregnant women. In Egypt the prevalence of obesity is 30.8% among rural women, 49.1% among urban women and the prevalence rates of fetal complication were 14.6% for obese women in the form of early miscarriage.16.5% of obese women were diabetics and 34.5% had chronic hypertension ***(WHO, 2011)***. Meanwhile, MCH nurses undertake the initial and ongoing assessments of the health and well-being of maternal and their infants. The comprehensive and specialized educational preparation of MCH nurses provides the necessary skills and knowledge to enable them to carry out consultation with the mother, the assessment, planning, delivery, ongoing monitoring and evaluation of maternal and child health care ***(Clark, 2008)*.**

AIM OF THE STUDY

Study aims to evaluate the effect of nutritional program for improving the obesity of maternal health through:

1. Assessing maternal knowledge about obesity during pregnancy
2. Assessing maternal practices related to their nutritional lifestyle to determine their needs.
3. Designing and implementing nutritional program according to the class of obesity.
4. Evaluating the effect of the program on the mother & neonatal health.

RESEARCH HYPOTHESES

Nutritional program will improve the health of maternal obesity & their newborn without complication.

Part (1)

HIGRHSPKR EGNANCY

High-risk pregnancy is broadly defined as one in which the mother, fetus or newborn is will be at increased risk for morbidity or mortality before or after delivery. Many factors may be involved, it includes obesity, inadequate prenatal care, unwanted pregnancy, genetic abnormalities and pre-existing maternal or fatal disease also, there are different obstetric disorders and commonly impose higher risk on the mother and fetus such as pre-eclampsia, eclampsia, premature and small size of gestational age ***(WHO, 2011).***

Weight:

Weight gain is an increase in body weight. This can be either an increase in muscle mass, fat deposits, or excess fluids such as water. Weight gain has a latency period. The effect that eating has on weight gain can vary greatly depending on the following factors: energy (calorie) density of foods, exercise regimen, amount of water intake, amount of salt contained in the food, time of day eaten, age of individual, individual's country of origin, individual's overall stress level, and amount of water retention in ankles/feet ***(Jebb, 2103)***.

Patternst :

Patterns of weight gain are as important as total weight gain besides setting goals for total weight gain with the mother

her progress need to be carefully monitored, using a standardized weight – gain grid in the prenatal record this should begin with accurate measurement and recording of height and weight on the initial prenatal visit an regular weight recording at each visit – persistent deviations from expected patters of weight gain are signals for progrem and reassessment of weight gain- goals ***(Wardle et al.,, 2012).***

Gestational weight gain guidelines that are based on pre-pregnancy body mass index (BMI) ranges for underweight, normal weight, overweight, and obese women recommended by the World Health Organization and independent of age, parity, smoking history, race, and ethnic background as shown in **Table (1).**

Table (1): Gestation weight gain guidelines

		Recommended Weight gain	**Weight Gain, Trimester**	
Category	**BMI(kg/m^2)**	**Kg(Ibs)**	**1st Trimester**	**2nd & 3rd Trimesters**
Underweight	<19.8	12.5-18 (28-40)	2-3 (5)	0.5(1)/week
Normal weight	19.8- 26.0	11.5-16(25-35)	1.6(3-5)	0.4(1)/week
Overweight	26.0-29.0	7-11.5(15-25)	0.9(2)	0.3(0.7)
Obese (include all classes)	>29.0	6.8(15)	---------	--------

Modified from Institute of Medicine (US)(2011). Weight gain during pregnancy: re-examining the guidelines. Washington, DC. National Academies Press;. © 2011 National Academy of Sciences.

Women with a normal weight–to–height ratio, the prenatal nutrition should allow for approximately about 2 to 4 pound (0.9 kg to 1.8 kg) of weight gain during the first trimester and then a subsequent weight gain about 1 pound (0.45 kg) per week during the second and third trimester.the total weight gain is about 25 to 35 pounds (11 to 15kg). Women carrying twins should gain 15.88 to 20.41 kg, for under weight women (body mass index <20), weight gain increase to28-40 pound (12.70 to 18.14 kg). Adequate weight gain during pregnancy is particularly important in preventing low birth weight infant among underweight women. For overweight women (body mass index between 26 and 29), weight gain decrease to15-25 pound (6.80 to 11.34 kg). Obese women (body mass index >29) should strive for the lower end of that weight gain ***(Institute of Medicine {IOM}, 2011).***

Maternal BMI and pregnancy weight gain reflect nutritional status before and during pregnancy.some evidences consider that weight gain have a significant relationship with poor pregnancy outcomes BMI and percentage of desired gestational weight gain. There are was no difference between weight gain an level of BMI, it may be showed that health care workers an pregnant women should pay more attention to gain weight during pregnancy regardless less their pre- pregnancy BMI ***(Yekta et al., 2013).***

Maternal Obesity:

Obesity was regarded as a pathological condition that is characterized by an accumulation of much fat than optimal body function, whereas over weight is an increase of the body weight above the some arbitrary standard in relation to a persons height. On the other hand, persons who are greatly overweight are also over fat conditions almost always appear together. **Obesity** occurs when the energy intake from food and drink consumption is greater than energy expenditure through the body's metabolism and physical activity over a prolonged period, resulting in the accumulation of excess fat ***(Powers, 2012).***

Maternal Obesity is general defined as a condition in which body weight is greater than 20% of standard weight for height. The massive obesity in pregnancy is not agreed upon. Used the criteria of pregnancy weight of more than 120% of ideal weight for height to define obesity and more than 150% for excessive obesity ***(Edward et al., 2012).***

The body weight represents the sum of both the fat and lean body tissue, therefore weight alone does not unequivocally indicate whether a person is overweight.several methods are available determine the percentage of body fat, as skin fold caliper measurements and can readily be affected by different factors as patients age, sex and ethnic background. Newly developed technique using bio-electric impedance to determine the percentage of body fat are commonly misused.Bioelectrical

impedance measurements may not be accurate in the body mass index (BMI), the best correlate with hydrostatically measure body fat ***(Leaf, 2013).***

Variety of methods for assessments of total body fat, such as body density, x-ray, body distribution of soluble gases and total body water have been used for research work in addition, a variety of anthropometric measurements (limb and trunk diameters and circumference) have been use. The weight/height body mass index (BMI) is the most useful anthropometric measurements. Other methods as CT scan, DEXA can be used to measure fat mass ***(Hassanien, 2010).***

Aetiology of obesity:

Brawarsky *et al. (2005*)) noted that the cause of obesity are complex and not fully understood. Classified the causes of obesity into genetic factor, nutritional factor, physical inactivity, socioeconomic factor, endocrine factor and physical factor.

Genetic factor:

Brawarsky *et al. (2005*) mentioned that an important genetic component must be involved in determination of body weight in general, and probably for obesity in particular. The risk for obesity is associated with genetically determined individual differences or reusability. Physiological arousal makes some people more responsive to salient external cues such as food, this in turn makes it more likely that they will eat,

overeat, and subsequently gain weight. Family members share diet, culture background and many aspects of lifestyle as well as genes. Therefore, family aggregation alone does not assure the presence of genetic effects ***(Bouchard and Tremblay, 2010).***

Hirsch et al. (2012) they suggest a model for the role of genes and environment in determining obesity in women. Genetic background largely determines the propensity to become obese, whether a predisposed person becomes obese, however, and the extent of obesity depends on environment exposures that are all likely to increase in weight if we eat more and exercise less, only afew of us are prone to become morbidly obese.

N u t r i t i o n:a l

Obesity is usually due to excessive intake of food rather than from massive overeating ***(Ross & Janssen, 2010)*** (Figure 1).

Mueche et al. (2011) stated that we often do not eat merely because we are hungry or stop because we are full. frequently, we eat out of habit eating three meals a day on schedule. Many obese women eat a negligible breakfast and concentrate on evening meal, thus promoting the storage of fat. Eating before sleeping leads to storage of the calories, since they are not needed to energy. The habit of eating that is associated with other activities, such as watching television may contribute to the occurrence of obesity.The consumption

of food, the periodicity with which it is eaten, and the absolute amount of energy derived from it are all relevant to the etiology obesity. Nutritional investigations of obesity traditionally focuse on quantifying total calories intake ***(Gallaher et al., 2012).***

Culture factors and acquired habits have often been cited as playing an important part. Thus, we may condition eating responses to habits and external stimuli rather than allow the physiological mechanism to operate. The habit of eating that is associated with other activities, such as watching television may contribute to the occurrence of obesity ***(Hill and Peter, 2011)***.

Figure (1): Healthy diet ***(adopted from Ashley et al., 2010):*** weight control in the diabetic women.

Socioeconomic

Colditz and Wolf (2011) stated that the interaction between socioeconomic status and family structure ,such as low socio economic status women tended to be fatter than higher socioeconomic status women except in single – parent household, may be due to single – parent low socioeconomic status families being poorer (in all necessary resources) than two- parent lows socioeconomic status families.

Oner et al. (2004) stated that the prevalence of obesity is higher among people of lower socioeconomic status. Epidemiologic studies have shown a strong association between socioeconomic status and the prevalence of obesity.

Endocrine)

Although popular thought ascribes obesity to glandular troubles, inactuality endocrinopathy is a rare causes of obesity. The fact that in women obesity commonly begins at puberty, during pregnancy or at the menopause suggests an endocrine factor ***(Field et al., 2011)***. In hypothyroidism and Cushing's syndrome (over activity of the adrenal gland). Obesity may occasionally be the presenting feature. These conditions are also associated with short stature, and their diagnosis should be considered when an obese women is found to be below average height or below that expected for her family ***(Ford et al., 2012).***

Cushing's syndrome causes central obesity which is associated with hypertension and diabetes. Women receiving

long term therapy with corticosteroids will usually become obese unless preventive measure are taken. There are certain well defined changes in metabolism associated with obesity which are: decrease glucose tolerance, increase plasma triglycerides, increase plasma cholesterol, increase plasma uric acid and decreased sensitivity to growth hormone ***(He et al., 2010).***

Physical factors:

WHO (2007) stated that the intervening behavioural determinants remain unclear. Region, season and population density could all affect the consumption of low caloric density food such as fruits or vegetables by their effect on price availability. Each could also affect activity patterns.

Barsh and Farooqiis (2000) stated the classified the causes of obesity into Genetic syndromes, hormonal disorders and medication that may cause obesity in women. Genetic syndromes associate with women obesity include the following, pradet willi syndrome, psudo hypopara thyroidism, cohen syndrome, Down syndrome and Turner syndrome. Hormonal disorders associated with adolescent, growth hormonal deficiency, growth hormone resistance, hypothyroidism, leptin deficiency, glucocorticoid excess, prolactin secreting tumors. Medication that may causes obesity in adolescent include, cortisol and other glucocorticoids and monoamino oxidase inhibitors (MAOIs).