CHAPTER II

REVIEW OF LITERATURE

This chapter deals with systematic scrutinization of information, which is relevant to the present study. The review of literature has been divided into 2 parts.

Part – A : Literatures related to the PIH maternal and perinatal outcome.
Part – B : Literatures related to conceptual frame work based on Widen bach helping art theory.

Part – A: This part includes 5 sections.

Section 1 Studies related to definition and prevalence of pregnancy-induced hypertension
Section 2 Studies related to Risk factors of PIH
Section 3 Studies related to maternal and perinatal outcome of PIH.
Section 4 Studies related to preventive strategies towards complications of PIH.
Section 5 Studies related to self care strategies on maternal and perinatal outcome
Section 6 Studies related to health education and information

2.1 Part – A Literatures related to the PIH maternal and perinatal outcome

Section 1 Studies related to definition and prevalence of pregnancy-induced hypertension

Definitions

Courtney Reynolds, MD, William C. Mabie, MD, & Baha M. Sibai, MD (2006).
Described Preeclampsia as a disease of theories and such theories are
- endothelial cell injury
- rejection phenomenon
- compromised placental perfusion
- altered vascular reactivity
- imbalance between prostacyclin and thromboxane
- decreased glomerular filtration rate with retention of salt and water
- decreased intravascular volume
- increased central nervous system irritability
- disseminated intravascular coagulation
- uterine muscle stretch (ischemia)
- dietary factors
- genetic factors

Armenian Medical Network (2005). Defined the Preeclampsia- eclampsia can mimic and be confused with many other diseases, including chronic hypertension, chronic renal disease, primary seizure disorders, gallbladder and pancreatic disease, immune or thrombotic thrombocytopenic purpura, and hemolytic-uremic syndrome. It must always be considered a possibility in any pregnant woman beyond 20 weeks of gestation. It is particularly difficult to diagnose when preexisting disease such as hypertension is present.
Preeclampsia (US: preeclampsia 2007) is a medical condition with hypertension arises in pregnancy (pregnancy-induced hypertension) association with significant protein in the urine.

American college of obstetrics and gynecology (ACOG 2002), Pre-eclampsia is diagnosed when a pregnant woman develops high blood pressure (two separate readings taken at least 6 hours apart of 140/90 or more) and 300 mg of protein in a 24-hour urine sample (proteinuria). A rise in baseline BP of 20 systolic or 15 diastolic, while not meeting the absolute criteria of 140/90 is still considered important to note but no longer diagnostic. Swelling, or edema, (especially in the hands and face) was originally considered an important sign for a diagnosis of Pre-eclampsia, but in current medical practice only hypertension and proteinuria are necessary for a diagnosis.

Armenian Medical Network (2003). Some women develop high blood pressure without the proteinuria (protein in urine); this is called pregnancy–induced hypertension (PIH) or gestational hypertension. Both Pre-eclampsia and PIH are regarded as very serious conditions and require careful monitoring of mother and baby.

Pre-eclampsia occurs in 6% of pregnancies, usually in the second or third trimester and after the 32nd week. Some women will experience Pre-eclampsia as early as 20 weeks, though this is rare. It is much more common in women who are pregnant for the first time.
Prevalence;

Douglas K, Redman C. (1994), found that eclampsia is prevailing about 1 in 2000 women in U.K and carries a maternal mortality of 1.8%. The HELLP syndrome is more common, probably about 1 in 500 women, but it is also dangerous like eclampsia.

Baird D. (1997), the study conducted in Scotland, which showed no difference in the incidence of pre-eclampsia between higher and lower social classes. There was a slight increases incidence in heavy workers.

Attolou. (1999), the investigator done a retrospective and prospective study for one year. The study showed a 7.65% of women with PIH, in which 59.4% of them with severe hypertension. 26.4% of women had pre-eclampsia and 41.5% of them end with chronic hypertension.

Buga GA, Lumu SB. (1999), done a study to determine the incidence of hypertensive disorders of pregnancy at Umtata General Hospital. In 16376 deliveries, 760 (4.6%) were complicated by hypertension. The mean ages of women were 25 years. The primi gravidae accounted for 42.9% and teenagers were comprised of 27.3%. Proteinuric hypertension was present in 66% of the hypertensive women. Incidence of eclampsia in Untata General Hospital was high as 7 per 1000 deliveries.

Garvic VD. (2000), stated that Hypertension affects 10% of pregnancies in the USA and remains a leading cause of both maternal and fetal morbidity and mortality. Risks to the fetus include premature delivery, IUGR, and death. The major goal is to
prevent maternal complications without compromising uteroplacental perfusion and fetal circulation.

**Lydakis C et al. (2001).** studied the prevalence of pre-eclampsia among normotensive and hypertensive women. The prevalence was 11.9% (19/159 cases) and 16% (34/213 cases) respectively. Though there is a high prevalence of pre-eclampsia in chronic hypertensive women that was not statistically significant. It reflects all women are at risk for PIH.

**Al. Muhim AA et al. (2003).** estimated the incidence of PIH in women attending for care and delivery at a hospital in Saudi Arabia among 685 women, 2.47% of them were diagnosed as having pre-eclampsia.

**Fang C & Vasten M. (2004).** the study conducted in New York City and observed that prevalence of hypertension was 3.8% highest for black and lowest for whites.

**Onuh So, Aisien AO. (2004).** conducted a retrospective study to find out a incidence of eclampsia among PIH patients at Benin teaching hospital at Nigeria over an 8 year period between 1995 to 2002. The study found that there were 103 cases of eclampsia of 1835 deliveries, giving an incidence of one in 76 (13.2%).

**Yucesoyg, et al. (2005).** determined the risk factors in prevalence, epidemiological parameters and maternal perinatal outcome in pregnant women with hypertensive disorder. Results of the study showed that among 5185 deliveries 438 (8.4%) were with PIH. among 255 cases recorded 138 (54.11%) were found to have severe pre-
eclampsia, 88(34.5%) were with mild pre-eclampsia, 28 cases (11%) had eclampsia and another 28(11%) had HELLP syndrome.

Jennifer E, Claydon, Craig mitton, Karavangattu, sank ran, shoo K. Lee and the Canadian neonatal network T M. (2007), compared the ethnic differences in perinatal risks, and infant outcomes amongst mothers of different ethnic groups, and concluded that, understanding these risk factors is important to enhance the delivery of specialized obstetrical care and neonatal outcomes among high risk pregnancies.

Section 2 Studies related to Risk factors of PIH.

Hamilton. (1775), realized through a randomized clinical trials twin gestation are predisposed to preeclampsia at 6 fold increase of times.

Rayon. (1831), described that, preeclampsia is more frequent in unmarried women than married women due to lack of antenatal care.

Mac. Gillivay I. (1958), defined the pre-eclampsia is a primary disorder which is more among primigravidae, due to the first time exposure to chorionic villi and in 1989, A observational study concludes that primi gravidae exposed to chorionic villi for the first time has more risk to develop pre eclampsia.

Cooper and Liston. (1979), found that sucessablity to preeclampsia are dependent upon a single recessive gene.

Behrman. (1985) & Kramer. (1987), Classified the risk factors of low birth weight in to seven categories namely, genetic, constitutional, demographic, nutritional,
medical and obstetrical risk factors. The presence of these factors in individual woman indicates that, the women are with increased chance of bearing a low birth infant.

**Fried man. (1988)., S.W.Walsh. (1990).,** stated that imbalance of placental prostaglandins causes vaso constriction, aggregation of platelet and decrease of uteroplacental blood flow may lead to pre-eclampsia.

**In 1924, Hinslemam** reported that, mothers with triplet gestation are more at risk for preeclampsia.

**Van Bogert L .J. (1995).,** studied the perinatal losses among 35 pre-eclamptic patients and found that perinatal mortality was 6 fold higher for fetus, when pregnancy was complicated by pre-eclampsia. Fetal losses with HELLP syndrome are much higher in primigravidae.

**Khan, Daya. (1996).,** identified that, 20% women with diabetes mellitus will develop preeclampsia. An incidence of 30% has been reported among women with Whites classification of D, F and R (Siddigi T et al.)

**Chemma B.S. (1996).,** done an epidemiological study and analyzed the effect of non-pharmacological therapy for hypertension and found that, a women consuming fiber less than 12gram /day was associated with 1.57% increase in risk for hypertension. A 4 year follow up study proved no risk, when fiber intake was more than 25 gram/ day, because it will decrease blood pressure and prevent complications.
David. (1998)., assessed the association between parity, age and socioeconomic status and found that, they are Interco related at the level of p<0.001 and may influence the pregnancy and the infant’s birth weight.

Hirve et al. (1999)., reported an association between low birth weight and a maternal age of less than 20 years, but, low birth weight was found to bee associated with preterm delivery rather than IUGR.

Martin JN. Jr. May WL Rinehart BK, Martin RW, Megan EF. (2000)., sought to ascertain weather a similar relationship exists between maternal weight and pre-eclampsia through a Retrospective study design among 434 mothers with HELLP syndrome. The results showed a significant association between increasing maternal weight and occurrence of pre-eclampsia at the level of P< 0.001. Increasing maternal age, nulliparity were significantly associated as risk factors for developing pre eclampsia.

Hahn S, Holz greve W. (2002)., studied the risk factors of pre-eclampsia. It has been documented that, the fetal cells such as fetal erythro blasts as well as cells such as fetal DNA in maternal circulation was more among women who develop pre-eclampsia. These findings have given support to the hypothesis that, pre-eclampsia is a disease process by which, and a placental lesion caused by hypoxia will allow the fetal material in to maternal circulation that may create an inflammatory response and endothelial damage. It ultimately results in pre-eclampsia and eclampsia.

Wasunna A, Mohammed K. (2002 oct)., the comparative study in Nairobi suggested that unfavorable socio, demographic and obstetric factors like being a single
parents, less formal education and being unemployed were the high risk for developing pre-eclampsia and related complications.

**Seyam YS, AL Mameid MS, Tamini HK. (2002).** stated that, growth restricted fetuses with normal umbilical artery velocimetry were significantly lower the risk of perinatal morbidity and mortality than those with abnormal velocity waveforms.

**Haddad B, Barton JR, Livingston JC, Chahine R, Sibai BM. (2000).** determined the risk factors for adverse maternal outcomes among women with HELLP syndrome, at Division of Maternal-Fetal Medicine, University of Tennessee, Memphis USA. The Maternal medical records of pregnancies complicated by HELLP syndrome managed between July 1, 1992, and April 30, 1999, were reviewed. Risk factors and maternal outcome variables were analyzed. Results showed that among 183 women with HELLP syndrome were studied. Eclampsia was present in 6%, an abruptio placenta was present in 10%, and disseminated intravascular coagulopathy was present in 8%. Forty-one women (22%) required transfusion of blood products. Incidence of eclampsia significantly decreased with increasing gestational age, from 16% at ≤28 weeks' gestation to 3% at >32 weeks' gestation (P <0.05) Disseminated intravascular coagulopathy was significantly associated with abruptio placenta (P <0.001) and acute renal failure (P <0.001). The study concluded that apart from, HELLP syndrome there are other risk factors also included like age, education etc.

**Boggess K.A.et al. (2003).** assessed the association between the maternal periodontal diseases and development of pre-eclampsia. The study revealed that the
mothers were at higher risk for pre-eclampsia, if they had severe periodontal diseases. The association was significant at the level of P<0.05.

Al.Muhim AA. (2003), done a study on maternal risk factors for pre-eclampsia are identified that, among the hospital based incidence, a rate of 2.4%, the high proportion of PIH cases occurring among nulliparous women and at the extreme ends of reproductive age (<20 and >40).

Onuh So, Aisien AO. (2004), conducted a retrospective study and found that PIH and eclampsia is significantly (P<0.001) occurred in nulliparous and unbooked mothers.

Jane Cleary, Goldman MD, Fergal.. (2005), estimated the effect of maternal age on obstetric outcome by faster trials. The Age groups were less than 35 years, 35-39 years and 40 and above. Multivariate logistic analysis was used to assess the effect of age on outcome. The results showed that, among 36,056 women, 28,398 (79%) were <35 years, 6,294 were 35-39 years, and 1,364 (4%) were > and ≥ to 40 years. The study showed that, increasing age was significantly associated with miscarriage. The ratio was 2:2.4 between 35-39 years and 40 and > years. Chromosomal abnormalities ratio was 4.0:9.9. Congenital anomalies 1.4:1.7, GDM was 1.8:2.4, placenta pravia was 1.8:2.8 and LSCS was 1.6:2.0. The same way, the age group of 35-39 years showed a risk for macrosomia in 1.4% of mothers. Placental abruption in 2.3%, preterm labor in 1.4%, LBW in 1.6% and PMR was 2.2% of the mothers.
Madan A, Palaniappan L, Urizar G, Wang Y, Fortmann SP, Gould JB. (2006). The objective was to compare perinatal risks and outcomes in foreign- and U.S.-born Asian-Indian and Mexican women, through the evaluation of 6.4 million U.S. vital records for births. RESULTS: With the exception of increased teen pregnancy and tobacco use, the favorable sociodemographic profile and increased rate of adverse outcomes seen in foreign-born Asian Indians persisted in their U.S.-born counterparts. In contrast, foreign-born Mexicans had an adverse sociodemographic profile but a low incidence of low birth weight (LBW), whereas U.S.-born Mexicans had an improved socio demographic profile and increased LBW, prematurity and neonatal death. CONCLUSIONS: Perinatal outcomes deteriorate in U.S.-born Mexican women. In contrast, the paradoxically increased incidence of LBW persists in U.S.-born Asian-Indian women.

Trivedi SS, Pasrija S. (2007). This study was conducted to evaluate the obstetric performance of teenage women at Lady Hardinge Medical College and Shrimati Sucheta Kriplani Hospital, New Delhi, India. In total of, 13,210 women were included in the study, of whom 840 were teenagers (<19 years) and 12,370 were ≥20 years. Antepartum, intrapartum and postpartum events were recorded and comparative analysis was done. The study found that teenage women were at a significantly higher risk for development of severe anemia (relative risk [RR] 1.61, P value <0.02), eclampsia (RR 1.95, P value <0.05), preterm labor (RR 1.25, P value <0.001), intrauterine growth retardation (RR 2.29, P value <0.001) and low birth weight (RR 1.24, P value <0.001). Assisted delivery (11.78% versus 2.23%, P value <0.001) was significantly more common and caesarean delivery (9.64% versus 17.18%, P value <0.001) was
significantly less common in teenagers. Moderate anemia, mild pregnancy-induced hypertension, preeclampsia, premature rupture of membranes, antepartum hemorrhage and post dates were all significantly higher in > or =20 years group. The studyo concluded that, we found that teenage women are a high-risk group, which is aggravated by social and cultural factors. Special attention is required to educate these women for more positive outcomes.

**Catov J M et al. (2007).**, estimated the risk of early or severe pre-eclampsia related to pre-existing conditions among 70924 women at Pittsburgh. It revealed as, the pre-existing maternal and obstetric conditions are associated with a high proportion of severe or early cases of pre-eclampsia. Obesity and overweight is contributing significantly the risk of preterm pre-eclampsia.

**Kumar A, Sharma AK, Prasad S. (2007).**, determined the risk factors and perinatal outcomes in intra uterine growth restriction fetus as compared to healthy fetus. It is a prospective case control study involving 44 singleton pregnancies with IUGR and other 44 without IUGR. both groups were compared at tertiary health center. The mean birth weight of the control group was 2640.07 + or – 428 grams, while that of the study group was with the birth weight of1865.45 = or – 270 grams. The mean height, weight and BMI of the study group were significantly less than the control group. The study revealed that, poor maternal nutritional status is an important modifiable risk factor for the prevention of IUGR.
Vidyullatha B. (2007), assessed the knowledge of mothers about risk factors of low birth weight at Govt. maternity hospital at Nay pool, Hyderabad. The knowledge scores of the mothers showed that, 29% of them were with low knowledge, 39% were with medium level of knowledge and 32% were with more knowledge. The mean was 28.38 with SD of 6.12. The relationship between knowledge and birth weight of the newborn babies was significant at the level of p< 0.05. The study declared that, the mothers who were illiterate, young belonged to lower socioeconomic status and medium level of knowledge were significantly associated with low birth weight of the babies.

**Section 3 Studies related to maternal and perinatal outcome of PIH.**

Sarin R, Ashi, Punjab MMR. (1992), pointed out that, 92% of deaths occurred in unbooked mothers. The mothers booked themselves had better outcome during labor and minimal postnatal complications. The distribution of death rate were as follows; 74.6% were from rural area, 76.5% were belongs to poor socioeconomic status, 26.2% were by hemorrhage, 37.2% by sepsis, 21% by PIH, and 15.3% by obstructed labor. Among these the calculated rates of avoidable factors were 89.6%. These facts were spoken about a need for proper antenatal care.

Rachdi R, Fekih MA, Massoudi L, (1993 April), the authors report on prospective and controlled study of HELLP syndrome in two groups of patients, normal and pre-eclamptic women. HELLP syndrome was seen only in pre-eclamptic women (19.3%). Material prognosis was poor with HELLP syndrome. Maternal mortality was high (16.7%). Severe maternal complications like severe hypertension, subarachnoid
hemorrhage, coagulation disorders and renal failure was more in women with pre-eclampsia.

**Vanbogaert LJ. (1995).** perinatal losses was studied in 37 pre-eclamptic patients, 13 of them had HELLP syndrome, only 23 newborns survived (62.5%), the perinatal mortality was 27%. It showed a 6 fold higher risk for the fetus when pregnancy was complicated by pre-eclampsia / eclampsia. The study also found that, fetal losses are much higher in primigravidae with pre-eclampsia..

**Mahhonen N, Harju M, Kirkinen P. (1996).** postpartum recovery was examined in 100 pregnancies complicate by severe pre-eclampsia. The incidence of IUGR predicted a slow postpartum recovery. Elevated diastolic blood pressure and albuminuria was present in one third of pregnancies even after 2 months of delivery.

**Garovic VD. (2000 Oct).** the author described hypertension affects 10% of pregnancies in the United states, and remains a leading cause of both maternal and fetal morbidity and mortality. 80% of the fetus born as premature with growth retardation, and stillbirth is common. Cardiac and renal complications are unavoidable.

**Vaughan JE, Walsh SW. (2002).** the study found the changes in placental super oxide dismutase, glutathione peroxidase, catalase, thromboxone and lipid peroxides, that occur in pre-eclampsia suggesting that maternal hyperlipidemia and increased iron levels may be responsible for placental oxidative stress and abnormalities in anti oxidants and thromboxone. These changes produce decrease of placental perfusion and fetal abnormalities.
Wasunna A. Mohammed K. (2002)., compared the socio demographic and obstetric factors between adolescents and older mothers by cross sectional descriptive design at Kenyatta National Hospital. The study showed that, mothers of very low birth weight babies tend to have unfavorable socio demographic factors like being single parents (P<0.001), having less formal education (P<0.001), being unemployed and aged below 20 years. The obstetric risk factors like, premature rupture of membranes, infections, interventional deliveries were more common among adolescent’s mothers.

Hafner E, Metzenbauer M.,(2003 April), the study was conducted among 1199 women; the placentae were measured by ultrasound at 12-16 and 22 weeks of gestation. Comparison of placental growth was done between normal mothers and pre-eclamptic mothers. The results showed pre-eclamptic women had poor placental growth and fetuses were SGA than the normal pregnant women.

Rachdi R et al. (2003)., reported that, maternal mortality was high and prognosis was poor among women when HELLP syndrome is complicating the PIH.

Prabha singhal. (2003), done a study on effect of antenatal care in maternal and fetal outcomes. Based on the findings, it was suggested that, ante care could be influenced by socio economic status, and literacy, because, the study showed that, the mothers with less formal education and belongs to lower socio economic status had poor perinatal outcome than the mothers with better education and socio economic status, they should under go vigilant antenatal care.
**Coelho TM et al. (2004).**, identified the rate of proteinuria on pregnancy outcome in hypertensive syndrome with singleton pregnancies. The presence of proteinuria predicted adverse maternal outcome with increase of complications proportional to its elevation. HELLP syndrome was present among 30.5% (40/131) followed by eclampsia with 3.8% (5/131), renal insufficiency with 0.7% (1/131) and one maternal death in that group with the presence of proteinuria. The worst perinatal outcome was observed vs without proteinuria as follows; prematurity (62.2% vs. 3.5%), birth weight <2.5kg (6.5%vs.5%), Apgar<7 in the 5th minute (30.4%vs 3.5%), IUGR (41.9% vs. 6.5%), still born (1.41% vs. 1.41%). So, it concluded that, the presence of proteinuria would increase the perinatal mortality.

**Vreeburg SA, et al. (2004).**, identified the factors associated with adverse pregnancy outcomes among women with hypertension during pregnancy. The perinatal data on 70386 live births were used in multivariate analysis. The risk for the four (neonatal, maternal, fetal, and infant) morbidities were all increased among women with hypertension compared with normotensive women. Among women with hypertension, older maternal age, nulliparity are at risk for more complications like operative deliveries and preterm birth, the Asian women, smokers and unemployed women had an increased risk for SGA (small for gestational age).

**El Nafaty AU. (2004).**, done a retrospective review of 302 cases of eclampsia treated at hospital at Gombe Nigeria. The study found that eclampsia was more common amongteenage mothers with a rate of 66.9% and primigravidae were 73.5%. Spontaneous delivery occurred in 52.6% of women, and caesarean section was performed in 40.45 of
the cases. There were 35 maternal deaths giving a fatal rate of 11.65. There were 111(36.8%) perinatal deaths during the study period.

Gaugler senden. (2006)., assessed the perinatal outcome with an onset of hypertension in pregnancy before 24 weeks of gestation. The study concludes that, if women got hypertension before 24 weeks of gestation, the rate of morbidity and mortality in perinatal period was high. The early onset and perinatal outcome was significantly associated at the level of p< 0.001.therefore, expectant management should not be considered as a routine treatment option for these patients, and screening to be done early to diagnose the PIH.

Onwuhafu PI, Oguntayo A (2006), done a prospective study of 27 perinatal deaths associated with 61 cases of eclampsia in the Ahmadu Bella University teaching hospital at Kaduna. (ABUTHK). The study revealed that, PMR associated with eclampsia was 409/ 10000 live births. More over, it was highest among women in the age group of 35 years and above, young and yielder gravida and also in mothers who were not registered for care.

Villar J, et al. (2006), studied on Preeclampsia, gestational hypertension and intrauterine growth restriction, related or independent conditions under United Nations Development Programme /United Nations Population Fund/World Health Organization/World Bank Special Program of Research, Department of Reproductive Health and Research, World Health Organization, Geneva, Switzerland. It was compared between determinants and perinatal outcomes associated with these obstetric conditions, among, 39,615 pregnancies (data from the WHO Antenatal Care Trial), 2.2% were
complicated by preeclampsia, 7.0% by gestational hypertension, and 8.1% by unexplained intrauterine growth restriction (i.e., not associated with maternal smoking, maternal under nutrition, Preeclampsia, gestational hypertension, and congenital malformations). The study showed that, Diabetes, renal or cardiac disease, previous preeclampsia, urinary tract infection, high maternal age, twin pregnancy, and obesity, were increased the risk of Hypertensive conditions. Independent of maternal age, primiparity was a risk factor only for preeclampsia. Both preeclampsia and gestational hypertension were associated with increased risk for fetal death, perinatal outcomes and severe neonatal morbidity and mortality. preeclampsia was associated with higher risk. The Conclusion of the study was Preeclampsia and gestational hypertension shared many risk factors and both conditions significantly increased morbidity and mortality.

Sengupta L I, Code AG. (2007), reported that, teenage mothers were facing a high risk of maternal death than other age group. The study showed a significant association at the level of p< 0.01. The rate of maternal death among teen-age pregnancy was 7.3/1000 deliveries.

GanZevoort W, Rep A, Bonsel GJ, De Vries JI, Wolf H.. (2007), a Prospective cohort study was done to assess the dynamics and incidence patterns of maternal complications in early-onset of hypertension in pregnancy, at Department of Obstetrics and Gynaecology, Academic Medical Centre, Amsterdam, in Two university hospitals, and tertiary care centres. Among 216 women participated in a randomised trial of temporising management in early-onset hypertensive disease (PETRA trial). Women were between 24 and 34 completed weeks and had HELLP syndrome, severe pre-
eclampsia, eclampsia or hypertension and fetal growth restriction. The study showed that, the median time to delivery or fetal death was 8.2 (range 0.1-44) days. The incidence of major maternal morbidity (total 26) was 4.2% at 2-4 days. The mean incidence of new or recurrent HELLP syndrome episodes was 5.5% (range 1.9-8.7%). The study concluded that, Pre-eclampsia is a dynamic disease, with extensive overlap of subtypes of the syndrome. Prolongation of pregnancy in early-onset hypertensive disorders results in the development of further HELLP syndrome.

Xiong X, Buekens P, Pridjian G, Fraser WD. (2007). examined the association between pregnancy-induced hypertension (PIH) and perinatal mortality. Study design was a population-based, retrospective, cohort study, which was conducted on 16,936 pregnancies delivered between January 1, 1989, and December 31, an infant 1990, in Suzhou, China. PIH was classified as gestational hypertension, preeclampsia or severe preeclampsia. The results of the study showed that, the perinatal mortality was 10.2 per thousand in normotensive women, 10.3 per thousand in women with gestational hypertension, 17.8 per thousand in women with preeclampsia and 37.0 per thousand in women with severe preeclampsia. Severe preeclampsia was associated with 3.4-fold increased perinatal mortality and all types of PIH were associated with markedly increased perinatal mortality (e.g., 15-fold increased mortality for severe preeclampsia). The study concluded that, intrauterine growth restriction secondary to PIH is associated with significantly increased perinatal mortality.

Buga GA. Lumu SB. (1999). assessed the maternal outcome with hypertensive disorders by pregnancy. The maternal complications were among 16376 deliveries
760(4.6%) were with hypertension, in which, pulmonary edema (3.9%), abruptio placenta (1.7%), HELLP syndrome (1.2%), maternal death (1.0%), acute renal failure (0.9%), coma with cerebral pathology (0.5%) and DIC (0.5).

**Ceska Gynekol. (2002).** reported the fatal complications by hypertension in pregnancy through retrospective epidemiological study at Prague podol. Results showed that, among 470 maternal deaths, there was 36 maternal deaths by severe PIH which contributes 7.7% to total maternal mortality. 10 cases were complicated by coma with DIC, 2 cases had abruptio placenta, and operative deliveries accounted for 71%. The mortality rate of fetus or newborn was 71%.

**Abroug F, Boujdaria R, Nouria S, Abroug S, Souissi M, Najjar MF, Secourgeon JF, Bouchoucha S. (2002).** conducted a prospective study on the HELLP syndrome, incidence and maternal-fetal outcome. In Intensive Care Unit, Hospital Universitaire Fattouma Bourguiba, Monastir, at Tunisia for a 6 month period among sixty-two consecutive preeclamptic and eclamptic women. All patients were systematically investigated for the effects of the occurrence of HS on maternal and fetal prognosis by comparing pre-eclamptic and eclamptic woman who exhibited HS (HS+ subgroup) with HS free patients (HS- subgroup). HS was found in 12 out of the 62 pre-eclamptic and eclamptic women (19.3%). Its occurrence was associated with higher maternal mortality (16.7% vs. 0%; *p* = 0.03), a greater incidence of eclamptic crisis (50% vs. 20%; *p* = 0.03), severe hypertension (33% vs. 8%; *p* = 0.03) and episodes of acute renal failure (66% vs. 30%; *p* = 0.02). Mean proteinuria was also higher in HS+ patients (4.6 +/- 3.3 vs. 2.2 +/- 2.5 g/day; *p* = 0.001). However, fetal outcome was not
significantly altered. The study concluded that, Pre-eclampsia and eclampsia might be more severe in the presence of HS with a worsening of maternal prognosis.

**Al.Muhim AA et al. (2003)**, studied the perinatal outcome among mothers with preeclampsia. The results were like, among 685 women, 30.2% had premature delivery, less incidence of spontaneous delivery (69.2%) as compared with healthy controls (86.2%). The pre eclampsia group had 22.8% of induced delivery, 14.9% of them were delivered by caesarean section, but in control group the ratio of induced and caesarean delivery was 6.8% and 9.6%. Placental abruption was 12.6%, oliguria present in 7.9% of mothers, 6.01% of them had coagulopathy and renal failure was in 4.1% of mothers.

**VigilDe Gracia P et al. (2004)**, determined the maternal outcome associated with severe chronic hypertension during the second half of pregnancy. The study showed that, a total of 154 women studied, 111(72%) had pre gestational chronic hypertension and 120(78%) developed superimposed preeclampsia, 71.41% (110) pregnancies were delivered by caesarian section, 8.4% had abruptio placentae, 8.4% with HELLP syndrome, acute renal failure in 3.9%, 1.3% were with postpartum encephalopathy and 1.3% had pulmonary odema. these were the most frequent maternal complications. The conclusion of the study was the intensive monitoring of the clinical status of the mother was associated with low maternal morbidity and the absence of maternal deaths.

**Lee W, Econnell et al. (2004)**, determined the prevalence of eclampsia and the associated maternal and perinatal outcomes in the province of Nova Scotia. The results of the study showed that, among 362 births, 39 women developed eclampsia (0.27/1000), and rate of major maternal complications were 32%, perinatal mortality rate was 64/1000
deliveries. But the rate of severe maternal complications was 56%. This indicates per eclampsia is associated with poor maternal outcome.

Yucesoy G et al. (2005), analyzed the maternal complications by hypertensive disorders of pregnancy. In 38 severe preeclamptic mothers, 88 had only mild preeclampsia, 28 had convulsion and 28 were with HELLP syndrome, oligohydraminos in 49 (19.2%) mothers and placental ablation in 19(7.5%) mothers, and the rate of caesarean section was more in preeclamptic patients than normal mothers.

Dissanayak V. (2007), reported the occurrence of morbidity and mortality associated with preeclampsia in nulliparous women at Singhalese hospital. The study revealed that the incidence of maternal complications like, proteinuria > or = 3+ in 87%, renal failure in 2%, low platelet count less than 10000 among 9% of women and one maternal death. This data insisted on nulliparous women are at risk for more complications than multi parous women

Lydakis C et al (2001) analyzed the fetal outcome among mothers with normotensive and hypertensive conditions during pregnancy. The study results showed that, there was a trend towards higher rates of pre term delivery (<37 weeks), cesarean section, small for gestational age babies, stillbirth, lower baby birth weight and ponderal index values. A progressive higher risk for fetal growth restriction and adverse perinatal outcome was shown in the hypertensive and preeclamptic groups.

Buch binder A et al. (2001), done a secondary analysis on perinatal outcome among mothers who had preeclampsia. The results showed that, women who developed
severe hypertension in pregnancy had significant higher rates of preterm delivery and SGA than the women with mild PIH.

**Rasmussen, S Irgens LM. (2003).** done a population evaluative based study the effects of early and late onset preeclampsia on fetal growth and body proportion. The results showed that birth weight, crown heel length and ponderal index (4.4%, 0.8% and 2.6%) were lower than in births without preeclampsia. The mothers with onset of preeclampsia after 30 weeks had birth weight and crown heel length were higher than the early onset of preeclampsia.

**Al Mulhim AA. (2003).** identified the fetal outcome among mothers with preeclampsia as follows, in 685 women, 2.34% of them had stillbirths, and early neonatal deaths were 1.02, which comprised overall mortality rate of 33.6/1000. These rates were high among women, who had no or irregular antenatal care and whose proteinuria was exceeded 18 gram/24 hours.

**Yocesoy G et al. (2005).** determined the perinatal outcome in pregnancies complicated with hypertensive disorder of pregnancy at Turkey. Among 255 mothers, 138 (54.11) were found to have severe preeclampsia, while 88 (58.8%), were with mild eclampsia. IUGR in 29.4%, placental ablation among 19 (7.5%), and delivery route was cesarean section for 150 (58.8%) were present. The intrauterine fetal demise was recorded in 24 cases and 10 died during intrapartum admission.

**Ganzvoort W, Rep A, Devries JJ, Bonsel GJ, Wolf H, PETRA (.2006).** investigators predicted the maternal complications and adverse infant outcome at admission and the subsequent development of major maternal complications or adverse
infant outcome in women with hypertensive complications of pregnancy remote from term. It was a randomized trial of temporizing management in 216 patients with HELLP syndrome, severe preeclampsia, eclampsia or hypertension-related fetal growth restriction and gestational ages between 24 and 34 completed weeks. End points were adverse infant outcome (perinatal death, severe morbidity) and major maternal complications (recurrent and newly acquired hemolysis, elevated liver enzymes, and low platelets; eclampsia) after admission. End point prevalences were comparable between the treatment and control groups. The association with age, parity, ethnicity, body mass index, gestational age, estimated fetal weight, blood pressure, antihypertensive medication, pulse rate, hemoglobin concentration, admitting center, diagnosis at inclusion, chronic hypertension, and thrombophilia was explored by logistic regression analysis. The study showed that, the adverse infant outcome was predominantly influenced by gestational age (odds ratio 0.4 per week increment). Major maternal complications were correlated to multiparty (odds ratio 0.4) and estimated fetal weight (odds ratio 0.9 per 100-g increment). The study reported that Prediction at admission of the clinical course of the disease and the development of additional maternal complications was not feasible.

Xiong X, Mayes D, Demianczuk N, Olson DM, Davidge ST, Newburn-cook C, Saunders LD. (2007), evaluated the effect of different types of pregnancy-induced hypertension on fetal growth at Perinatal Research Center, the Department of Public Health Science, University of Alberta, and Edmonton, Canada. A retrospective cohort study was conducted on the basis of 16,936 births from January 1, 1989, through December 31, 1990, by means of data from a population-based perinatal database in Suzhou, China. Pregnancy-induced hypertension was classified as gestational
hypertension, preeclampsia, or severe preeclampsia-eclampsia. The study result was
Gestation was 0.6 week shorter in women with severe preeclampsia than in normotensive
women (P <.01). However, the risk of preterm birth was not increased with any
classification of pregnancy-induced hypertension (for severe preeclampsia: adjusted odds
ratio 1.75; 95% confidence interval, 0.88-3.47). Preeclampsia and severe preeclampsia
increased the risk of intrauterine growth restriction and low birth weight. The adjusted
odds ratios of low birth weight were 2.65 (1.73-4.39) for preeclampsia and 2.53 (1.19-
4.93) for severe preeclampsia. However, the risk of low birth weight was not increased
significantly for gestational hypertension (adjusted odds ratio 1.56 [1.00-2.41]).
CONCLUSION: Preeclampsia increases the risk of intrauterine growth restriction and
low birth weight.

Section 4: Studies related to preventive strategies of PIH.

Fretts and colleagues. (1993), found that foetal death rate decreased to 70% by
increased prenatal visits and incidence of preeclampsia also decreased from 13.1 to 1.2/
1000 live births. This insists on prenatal visits.

Julnes G. (1994 Feb). the study suggested to use resource mothers programme to
reach high-risk adolescents to promote a higher level of perinatal care and favorable
perinatal outcome. Information and teaching mothers can bring down maternal
complications.

Grohar. J. (1994)., the investigator supported that the knowledge of giving
information, communication and collaboration skills are necessary in giving quality
antenatal care. Information on high risk factors can bring down the complications of PIH
in mother and fetus. The study suggests teaching on dietary habits, exercise, rest, follow up are the primary prevention of complications.

**Saroj Sharma, Sukshan chopra. (1997),** done a study on need for information for hospitalized patients among 100 patients and found that, existing bridgeable knowledge gap between what information is provided to the hospitalized patients and what they needed by them. If information is provided by qualified personnel and as per the need the utilization will be more effective and high-risk conditions during pregnancy will be avoided. Providing information on Medicare, cost of treatment, complications of diseases and how to prevent it can fill this bridgeable gap the information received and outcome of disease was significant t the level of p<0.05.

**Vatten L.J, Romund Stad PR, Holmen T.L, et al. (2003 March),** the study was conducted among 4096 Norwegian girls 13-19 years old. Questionnaire information was collected on age at menarche, measurement of blood pressure, height and weight. Results showed adolescence with high blood pressure have increased association with preclampsia. The study suggested following the adolescents with high diastolic blood pressure towards prevention of preeclampsia in later period.

**Chip Chase J. Peebles D, Rodock C. (2003),** a cross sectional study was done between PIH women and normal pregnant women to compare the cerebral blood volume response to a change in maternal posture from left lateral to sitting position. The study results showed that pre eclamptic women had median rise in cerebral blood volume, which can lead in to severe complications. The study supported to follow left lateral position during pregnancy to prevent increase in cerebral blood volume.
Kramer M et al. (2003), studied the relationship between the energy and protein intake in pregnancy and suggested that, protein and energy does not appear to influence the preeclampsia rates, but helps in increase of placental perfusion and prevention indirectly.

Abram B et al. (1999), identified a model diet plan for pregnant women towards prevention of high-risk complications and for a healthy fetus. This should be influenced and utilized by themselves towards prevention of PIH, IUGR, anemia and GDM.

L.Nagaby AU et al. (2004), recommended the mass media education of the general populace and counseling of young women on care during pregnancy. If done so, there will be provision and use of life saving treatment can be paramount. At the same time, an effort towards eliminating the conditions that creating unbooked emergencies is not possible always. But, identifying the complications by the young people during their pregnancy can bring down the complications like PIH and eclampsia there after.

Yucesoy G et al. (2005), suggested that hypertensive disorder of pregnancy is associated with increased risk of maternal and perinatal adverse outcome. But, widespread of prenatal care can prevent the incidence and complications of PIH. In this regard education of primary medical care personnel, provision of facilities for prompt diagnosis of high-risk patients and timely referral to tertiary medical centers is essential in prevention of complications of PIH.

Dissanayak V. (2007), reported that women who developed preeclampsia had significant higher systolic blood pressure (p<0.001) and diastolic blood pressure at the
time of booking at approximately at 13 weeks of gestation. It is also, suggested that fetal and maternal morbidity and mortality can be reduced by improving the guidelines for medical care or using the western diagnostic criteria at the time of booking or at the early weeks of gestation. If so, mothers at risk can be identified and complications during pregnancy like PIH can be reduced.

**Spina police RX et al. (1983),** done a study on effective prevention of gestational hypertension in primigravidae women, and noted that, a significant decrease was there in the incidence of hypertensive complications among mothers with bed rest in the left lateral position than the control group.

**Smith S J et al. (1985),** investigated the effect of moderate potassium chloride supplementation in essential hypertension and also it is additive to moderate sodium intake by many controlled trials. The results concluded that potassium supplement by 50-80 mmols can decrease the hypertension in pregnant women. The recommendation of dietary intake of potassium foods will be benefiting women on preventing PIH. The study also showed that, potassium is not a additive to sodium, that has to be maintained separately.

**Newman V, Fullerton JT, (1990),** tested about, one theory which, proposes a complex relationship between nutritional imbalance and the pathophysiology of these diseases.

In that it was suggested that, outpatients nutritional counseling, dietary alteration and nutrition supplementation would prevent occurrence of PIH.
Ritchie LD, King JC. (2000), observed the relationship between the calcium intake and occurrence of PIH. The study found that the calcium plays the significant role in the etiology, prevention and treatment of PIH, though, the pathogenesis of PIH is unclear, several alterations in calcium metabolism have been identified. However, high risk groups such as, teen pregnancy populations with inadequate calcium intake and women at risk of developing PIH may benefit from consuming additional dietary calcium. But, dietary calcium will not be sufficient during pregnancy. So, supplementation of 1gram to 1.5 gram is must/day.

Maine D. (2000), stated that, nutrition has influence on causal role in the etiology of toxemia, but, not much evidence available to prove the effect of nutrition in maternal mortality from toxemia of pregnancy.

Wallen bug HC. (2000), analyzed the many interventions advocated to prevent or delay the onset of preeclampsia and reveals that, calcium supplementation and prophylactic low dose aspirin shown efficacy in prevention of PIH during small-randomized trials. Recent evidence shown that, supplementation with vitamin C and E could prevent preeclampsia. But, till now, there are no confirmatory evidences.

Geelhoed DW et al. (2003), measured the impact of the safe motherhood initiative on hospital based maternal mortality through retrospective analysis of all 229 maternal deaths in a district hospital at rural Ghana and found that, overall maternal mortality ratio of 1077/100,000 live births did not change over 3 years, but sepsis hemorrhage, obstructed labor, anemia and pre-eclampsia were diminished This strengthens the need for more implementation of safe motherhood programme.
**Chip case J et al. (2003)**, compared the cerebral blood volume response by infrared spectroscopy to a change in maternal posture among pregnant women with and without the hypertensive disorders of pregnancy. The study showed that, among normotensive and chronic hypertensive mothers, there was a fall in median cerebral blood volume when they change a posture from the left lateral to sitting position. But, there was a rise in median cerebral blood volume among mothers with preeclamptic during a postural change.

**Veena agarwal and Ravneet Gulsan. (2003)**, stated that calcium supplementation is a safe and effective measure for reducing the incidence of PIH. Calcium reduces the risk for PIH by maintaining ionized calcium level in blood, which is crucial for the production of endothelial nitric oxide to maintain vasodilatation. On the basis of results of the 5 randomized trials, the risks of high blood pressure were lower in women with dietary calcium supplementation. It was significant at the level of p<0.01.

**Onuh SO, AisienAO.(2004)**, studied on timely referral of high risk patients coupled with availability of emergency obstetric and neonatal care services would reduce the incidence of eclampsia associated mortality and morbidity or not. The study found that, 85(83%) of patients had at least one premonitory symptom including headache (82.4%), visual disturbance (10.6%) and epigastric pain (7%). Since there is a lack of information on warning signs of eclampsia and timely referral, there were 9 still births and 16 early neonatal deaths among 103 cases with eclampsia.
Skokie F, Huratovic S. (2006), assessed the maternal and perinatal outcome at Yuzla canton, the study showed that. The perinatal and maternal mortality were significantly higher during the disaster episodes. It is mainly due to inadequacy and poor accessibility of perinatal and maternal health care.

Meher S, Duley L. (2006), assessed the effects of rest or reducing physical activity during pregnancy for preventing preeclampsia and its complications in women with normal blood pressure. Results showed that, among 106 women, there was a statistical significant reduction in the risk of PIH with 4-6 hours of rest. Rest of 30 minutes/day plus nutritional supplementation was associated with a reduction in the risk of pre-eclampsia at p<0.01 level so. The daily rest with or without nutritional supplementation may reduce the risk of preeclampsia for women with normal blood pressure.

Meher S, Duley L (2006), found that, the association between an exercise or other physical activity on prevention of preeclampsia and its complications Two small trials among 45 women showed, the moderate intensity regular exercise with maintenance of normal physical activity during pregnancy has no effect for preeclampsia because the confidence intervals were wide and crossed the line of no effect. But, it may be due to less sample size. The exercise can be recommended because it did not show any negative effect on pregnancy.

American pregnancy organization. (2006), analyzed the relationship between rest and complications of pregnancy and announced that, bed rest decreases the venocaval compression and increases the blood flow to the placenta. So placental
perfusion will increase and thereby the complications to the fetus as well as the mothers will decrease.

**Johnwiloy. (2006),** declared that marine oil and prostaglandin supplementation during pregnancy to group of mothers really helped in the form of prevention of preeclampsia and IUGR. The study also stated that, calcium supplementation during pregnancy will prevent hypertensive problems.

**Giardina JB, Cockrell KL, Granger JP, Khail RA. (2002),** studied on Low-salt diet enhances vascular reactivity and Ca (2+) entry in pregnant rats with normal and reduced uterine perfusion. The study investigated whether a low-salt diet during pregnancy alters the mechanisms of vascular smooth muscle contraction or not. Active stress and (45) Ca (2+) influx were measured in endothelium-denuded aortic strips of virgin and normal pregnant Sprague-Dawley rats and a hypertensive pregnant rat model produced by reduction in uterine perfusion pressure (RUPP), fed either a normal-sodium (NS, 1% NaCl) or low-sodium diet (LS, 0.2% NaCl) for 7 days. Thus, a low-salt diet in pregnant and RUPP rats is associated with increases in vascular reactivity that involves Ca (2+) entry from the extra cellular space but not Ca (2+) release from the intracellular stores and a low-salt diet suggests activation of other vascular contraction mechanisms in addition to Ca (2+) entry. The study suggest that, reduction of dietary salt intake should be carefully monitored during pregnancy and pregnancy-induced hypertension.

**Gail forza S. (2007),** stated that, less protein intake will lead the liver not to circulate serum proteins such as albumin, and the water is lost from blood flow in interstial space and causes edema, which may turn into metabolic PIH.so, adequate
protein intake will prevent PIH. Though all PIH is managed in the same way, most hypertension in human pregnancy is physiological or benign not related to metabolic toxemia in late pregnancy.

Rishma Dillon pai, Fируза Parikh. (2007), identified that, plenty of fluids will prevent headaches, uterine cramping, UTI and swelling, because the indulging fluids indirectly increase the perfusion to placenta, so, the complications during pregnancy will be prevented.

Stepnie. (2007), studied the exercise in pregnancy on edema, placental perfusion and uterine cramping. The exercise recommended by physician will decrease the nausea, and mood swings which in turn help for healthy pregnancy. Exercise will increase the placental perfusion, the relaxation of pelvic muscles will increase the tonicity of pereneal muscle and help in easy labor with less complications.

Gail forza S, Brewer and Thomas etal. (2007), recommended that, Salt in pregnancy or an alternative to salt in pregnancy are unnecessary. Because salt is a change element in maintaining this dramatical function of blood vessels. Salt helps the body to retain fluid in normal level, so, no need in reduction or addition of salt during pregnancy. Because more salt will retain more fluid, which again brings the edema back, thereby normal salt will be able to maintain the blood pressure.

Section 5: Studies related to self-care strategies on maternal and perinatal outcome

Mottola et al. (1994), said that, either continuing or beginning exercise during pregnancy and the outcome as long as it is normal pregnancy, it does not adversely affect birth weight.
Hoja et al. (1995), analyzed the effect of calcium metabolism in normal and hypertensive pregnancy and reported that, an alteration in calcium metabolism is a pathogenesis of hypertension during pregnancy; low intake of calcium is linked to preeclampsia/ eclampsia. The supplementation of calcium may lower the blood pressure and prevent the occurrence of PIH. They also declared that one-gram of calcium and 60 mgm of elemental iron and minimum of 500 gram of vitamin C to be taken with diet to minimize complications.

CSSM. (1996), declared that, the mother needs to rest on her side for 2 hours in the day and 8 hours sleep in night with short periods of rest in between physical work can improve the fetal growth.

Chamberlain and pipkin. (1998), suggested that, any activity that involves lifting body weight and therefore constitutes exercise. Pregnancy itself can be regarded as a form of exercise. During pregnancy muscles work progressively harder. They adapt to the extra workload by becoming more efficient.

Hall DR et al. (2000), evaluated the perinatal outcome of expectant management of preeclampsia and concluded that, expectant management of early onset of hypertensive disorders and careful neonatal care led to reduction in high perinatal and neonatal morbidity.

Wit Hagen MI et al. (2001), assessed the effluent of prolongation of pregnancy on neonatal outcome by p. It concluded that, prolongation of pregnancy will reduce the morbidity.
Chipper R M. (2002), compared the effects of labor induction with those of cesarean delivery without labor on neonatal outcome by severe preeclampsia and delivery of very low birth weight infants. Results showed that, 400 women with severe preeclampsia who delivered infants between 750 and 1500 gram majority of mothers 280(70%) had induced labor and 120( 30%) of them delivered without any induction. The mothers who had vaginal delivery with apgar scores was good than the mothers who had cesarean delivery. at 5 Minutes and I minute. it indicates labor induction is complicated for mother with severe pre-eclampsia. Induction of labor and low birth weight had significant association at the level of p<0.001 among mothers with pre eclampsia.

Maria D. (2002), assessed the antenatal evaluation of the fetus by fetal movement monitoring and stated that,” count to 10” fetal kick chart through ABCDE criteria will help us to detect fetal distress early than just prescribing the fetal kick count chart. (A-0-15 mts, B-16-30mts, C-31-45mts, D-46-60 mts, E->60mts). Asking the women to do “count to10” and ask her how many minutes she takes to get the count of 10. If above 60mts or less than 15mts the mother needs to count or come for evaluation.

Petroci S et al. (2003), explored the relationship between the number of antenatal visits and adverse perinatal outcome. The study revealed a significant association the number of visits and low birth weight at the level of p< 0.001. The study also revealed a significant association between the number of visits and delivery by caesarean section. The more the mothers visited had fewer incidences of operative deliveries and low birth weight babies.
Xiao R et al. (2003), examined the effect of preeclampsia on fetal growth among 155 women with preeclampsia and found that, preeclampsia was associated with a 3.8 fold increased risk of low birth babies \((p<0.01)\) and 3.6 times increased risk of small for gestational age.

Veena Agarwal and Ravneet Gulshan .(2003), suggested that calcium supplementation; vitamins and minerals have important influences on pregnant women and growing fetus. Deficiency of minerals such as calcium, magnesium, selenium and copper have been associated with complications of pregnancy childbirth and fetal development.

Prabha Singhal etal. (2003), identified that, the incidence of total complications in booked cases were 46 (13.68%) but, in unbooked cases it was 138(35.93%), which is 3 times more as compared to booked cases. Hypertensive disorders were complicated as eclampsia more in unbooked cases (5.48%) than booked cases (0.07%). the incidence of placenta previa was 18(4.69%) in unbooked cases and only 1.05% in booked cases. The study concluded that, antenatal care can reduce the maternal complications.

Aali BS etal. (2004), assessed the frequency, epidemiological factors, complications and outcome of severe preeclampsia and eclampsia. The majority of the patients were young and primigravidae. The patients who have not sought prenatal care have more complications like HELLP syndrome, DIC, ARF, PPH and neurological complications. The mothers with severe preeclampsia had high towards complications. So, seeking for antenatal care regular visit will increase the maternal outcome.
Baha M, Sibai MP. (2005), done a study on perinatal outcome among 790 mothers with PIH, and found that 49% of them had eclampsia, 7-10% of them had placental abruption, 3.5% with pulmonary edema, ARF among 5-9%, ARDS / HELLP in 10-18%, and anemia in 2.5%. Among all complications eclampsia was high in incidence, which can be prevented by early identification and prompt treatment.

Onwuahafua PL, Oguntayo A. (2006), assessed the perinatal mortality associated with eclampsia and suggested that, making perinatal care available to all will be improving the quality of care. Early resort to caesarean section and use of perimorterm caesarean section in carefully selected women may reduce the deaths.

Anderson JE, Ebrahim S, Floyd L, Atrash H. (2006), assessed the prevalence of risk factors for adverse pregnancy outcome during the preconception stage and during pregnancy, and to assess differences between women in preconception and pregnancy. Data from the 2002 and 2004 Behavioral Risk Factor Surveillance System, United States, were used to estimate the prevalence of selected risk factors among women 18-44 in the preconception period (women who wanted a baby in the next 12 months, and were not using contraception, not sterile and not already pregnant) with women who reported that they were pregnant at the time of interview. RESULTS; pregnant women tended to report lower levels of risk than preconception women. Preconception interventions are recommended to achieve a more significant reduction in risk and further improvement in perinatal outcomes.

Hoga LA, Reberte LM. (2006), the objective of this study was to evaluate the effectiveness of the use of the body techniques in a group of pregnant women. The
descriptive categories of the experience were: the body techniques relieved the pregnancy discomforts, had encouraged the participation in the sessions, the use of body techniques in a group of pregnant women promoted self care of the members; body techniques intensified the link among the couples and gave conditions for the integration of the members. There are limitations in use of the body techniques.

Barton JR, Istwan NB, Rhea D, Collins A, Stanziano GJ. (2006), evaluated the cost savings of outpatient management services for women with pregnancy-related hypertensive conditions. The outpatient management program included verbal and written patient education related to the hypertensive disease process during pregnancy as well as self-care procedures. Biometric data (ie, automated blood pressure measurement, qualitative urine protein) were collected at least daily by the patient and transmitted telephonically to a nursing call center. Data were evaluated and subjective symptoms assessed daily. Electronic records were maintained and reports provided to the prescribing physician and case manager. To evaluate cost-effectiveness, a model was developed to compare the cost of the program plus adjunctive antenatal hospitalization, to control data. The mean gestational age at program start was 32.6 weeks. Antenatal hospital admission was required for 24.8% of patients, with a mean length of stay of 2.3 days per admission. Progression to severe preeclampsia occurred in 14.3% of patients. Mean gestational age at delivery was 37.0 weeks. Antepartum charges averaged 10,327 US dollars per control patient and 4,888 US dollars per program patient, a difference of 5,439 US dollars. For each dollar spent on outpatient management, an average of 2.50 US dollars was saved. Utilizing outpatient management services for women with pregnancy-related hypertension reduces the need for inpatient care and is cost-effective.
Schmidt MD, Pekow P, Freedson PS, Markenson G, Chasan-Taber L. (2006), done a study on Participation in physical activity during pregnancy in risk of gestational diabetes mellitus and preeclampsia and help prevent excess maternal weight gain. The purpose of this cross-sectional study was to describe total physical activity (household/care giving, occupational, leisure, sports/exercise, and transportation) and correlates of total physical activity in a racially and economically diverse sample of 233 prenatal care patients. METHODS: Bilingual interviewers administered three 24-hour physical activity recalls among women in the first trimester (11%), second trimester (36%), and third trimester (53%) of pregnancy. RESULTS: Median total energy expenditure (MET-hours/day) was similar among women in the first and second trimesters (33.4 and 33.8 MET-hours/day, respectively), but not statistically significantly, lower among women in the third trimester (32.6 MET-hours/day). Moderate intensity activity followed a similar pattern, being statistically significantly lower among women in the third trimester; vigorous intensity activity was low among women in each trimester of pregnancy. In terms of activity type, household/care giving activity was the largest contributor to both total and combined moderate and vigorous intensity energy expenditure among women in each trimester, constituting 24%-40% of total energy expenditure. Overall, total energy expenditure was having positive association with increasing education and a history of previous live births (p < 0.01). CONCLUSIONS: Results from this study highlight the importance of including household/caregiving and occupational activities in addition to sports/exercise activities in the assessment of total energy expenditure during pregnancy.
McClure EM, Goldenberg RL, Bann CM. (2007). studied the relationship between maternal mortality, stillbirth and three measures of obstetrical care, using data provided by the World Health Organization from 188 developed and developing countries, correlations and linear regression analyses between maternal mortality, stillbirth rates, cesarean section rates, skilled delivery attendance, and >or=4 prenatal visits were done. The study results indicated that, Stillbirth and maternal mortality rates were strongly correlated, with about 5 stillbirths for each maternal death. However, the ratio increased from about 2 to 1 in least developed countries to 50 to 1 in the most developed countries. In developing countries, as the cesarean section rates increased from 0 to 10%, both maternal mortality and stillbirth rates decreased sharply. Four or more antenatal visits were not associated with significant reductions in maternal deaths until about 60% coverage was achieved.

Fine P, Burgio K, Borello-France D, Richter H, Whitehead W, Weber A, Brown M; Pelvic Floor Disorders Network. (2007). the purpose of this study was to describe the teaching and practicing of pelvic floor muscle exercise (PFME) before and after delivery. A secondary data analysis from a prospective multicenter cohort study was done. Primiparous women (n = 759) with term singleton delivery were interviewed 6 months after delivery. The study revealed that, Sixty-four percent of the women had been taught PFME, most with verbal (76%) and/or written instructions (55%) and a few (10%) during pelvic examination. Women with anal sphincter tears were not more likely to receive instruction or reminders after delivery. More women with college education (74%) were taught, compared with women without a college education (37%; P < .0001). Of those women who were taught, 68% performed PFME after delivery, and 63% were
still performing the exercises 6 months after delivery. Results reveal tremendous potential for the improvement of PFME education and targeting at-risk women in the peripartum period.

Kennedy HP, Gardiner A, Gay C, Lee KA.. (2007)., a qualitative study was done to learn from 20 mothers about their experience of sleep during pregnancy and the immediate months of becoming a new mother. The study was part of a larger randomized clinical trial on an intervention to improve sleep and well-being among new mothers. a Semi-structured, audio taped interviews were conducted in which women were asked to describe the continuum of the sleep experience across the pregnancy and early postpartum and to describe strategies they found helpful as they established sleep patterns with their infant. RESULTS AND CONCLUSIONS: Sleep disturbances were common to all of the mothers, and sleep became a negotiated behavior as they adjusted to the mothering role. The study supported the Strategies for sleep like included enlistment of partners to facilitate naps, development of a "sleep consciousness," bed sharing and use of Mercer's stages of becoming a mother can be used to help the mothers to incorporate the sleep changes into their lives. This may indirectly influence the perinatal outcome, because, sleep and rest increases the perfusion to the uterus.

Simrat Haur N, Singh J. (2007)., done a study on knowledge of urban mothers about high-risk conditions during pregnancy and found a poor level of knowledge was there among 82% of mothers. He suggested that, increasing knowledge level would help to prevent high-risk conditions and its complications.
Mathews et al. (2007), reported that the traditional therapy for hypertension like, bed rest, low caloric, low salt, and sedation would improve the maternal fetal outcome.

Section 6 Studies related to general information and health education;

Gita Ramaswamy. (1998), expressed her opinion in her article “Being pregnant” that a pregnant women needs to take more rest, a balanced diet especially, Protein, less fat, calcium and iron in the natural from (milk, meat and dark green vegetables) and to have gentle sex, that too be avoided in first trimester.

Lindgren K. (2005), three studies were conducted. A content validity study with nurse experts, a content validity study with pregnant women, and a cross-sectional study using mailed surveys to test the reliability and construct validity of the Health Practices in Pregnancy Questionnaire-II (HPQ-II). Settings: Nurse-midwifery and obstetric physician practices. PARTICIPANTS: Clinical experts (n = 8) and pregnant women (n = 10 for Study 2; n = 312 for Study 3). The HPQ-II, a self-report instrument that measures pregnancy health practices were evaluated. RESULTS: Content validity was established with two reviews of the HPQ-II conducted by clinical experts and pregnant women. A satisfactory Content Validity Index and Construct validity was supported by statistically significant correlations with a measure of pre pregnancy health practices, and a theoretically related measure of women's attitudes toward their pregnancies and babies. Reliability (internal consistency) was satisfactory. So, this instrument promises to be useful in research and practice involving health practices during pregnancy.
Kumbani LC, Mclnerney P. (2006), the study aimed to explore knowledge of obstetric complications amongst primigravidae attending an urban health centre in Blantyre, Malawi. A descriptive study design was used. Forty-five primigravidae from the urban setting with a gestation period between 28 and 42 weeks were interviewed. The findings showed that participants were more aware of obstetric complications that could occur in pregnancy than of complications that may occur during and after delivery. Sixty percent of the participants were knowledgeable about obstetric complications in pregnancy. The majority of the participants, 73% and 82.2% did not know of any problems that could occur during and after the birth of the baby respectively. Participants had limited knowledge of complications that may need immediate treatment during all three periods. Fifty-eight percent (95% ci: 43; 73) of the primigravidae had some knowledge and could make an informed decision to go to a health facility with pregnancy complications. However, only 24% (95% ci: 11; 38) of the primigravidae had some knowledge and could make an informed decision to go to a health facility with complications after delivery. These findings suggest a critical need for provision of information on obstetric complications especially those that may occur during and after birth with emphasis on those obstetric complications that require immediate treatment.

Gould JB. (2006)., reported that, research and training in perinatal epidemiology and outcomes analysis have not kept pace with our need to understand the interplay between risk, intervention, structure and outcome. This knowledge is essential to the development of the clinical/organizational and training strategies that will enable perinatal medicine to fully realize the promise of basic and translational research.
Sibley LM, Sipe TA. (2006)., done a study at Center for Research on Maternal and Newborn Survival, Emory University, on the Evidence of the effectiveness of TBA training, based on 60 studies and standard meta-analytic procedures, includes moderate-to-large improvements in behaviors of TBAs relating to selected intrapartum and Postnatal care practices. Evidence suggests that, in settings characterized by high mortality and weak health systems, trained TBAs and other health personnel can contribute to the Millennium Development Goal 4—a two-thirds reduction in the rate of mortality of children aged less than 14 years by 2015—through participation in key evidence-based interventions and also through information on perinatal care

White K, Small M, Frederic R, Joseph G, Bateau R, Kershaw T. (2006)., the purpose of this study was to assess the knowledge of health care seeking behavior among pregnant women in rural Haiti. Eighty-two pregnant women were interviewed to assess care seeking behaviors during pregnancy, satisfaction with services, reliance on social networks, and management of pregnancy-related illness. Twenty-five percent reported not seeking care in the formal health sector for a pregnancy-related illness; 32% delayed seeking care. Women relied primarily on their husbands and mothers for health care advice during pregnancy and times of illness, and coped with illness by lying down. Strategies for improving awareness and health care access are discussed.

Tita AT, Selwyn BJ, Waller DK, Kapadia AS, Dongmo S. (2006)., identified the factors associated with important (> or =50%) variation in awareness and practice of evidence-based obstetric interventions in an African setting by Cross-sectional analysis of data from Reproductive Health Interventions at North-west province, Cameroon, Africa.
All Health workers including obstetricians, other physicians, midwives, nurses and other staff providing reproductive care were included. The main outcome measures were Prevalence ratios (PR) of uniform awareness and practice of four key evidence-based obstetric interventions from the World Health Organization Reproductive Health Library (WHO RHL). The study found as, a total of 15.5% (50/322) of health workers were aware of all the four interventions while only 3.8% (12/312) reported optimal practice. Evidence-based awareness was strongly associated with practice (PR = 15.4; 96% CI: 4.3-55. The conclusions of the study were several factors including obstetric training and continuous education positively influence evidence-based awareness and practice of key obstetric interventions. Confirmation and application of this information may enhance the effectiveness of programmes to improve maternal and perinatal outcomes.

**Strahle A, Stainton MC. (2006).** analyzed the Comments of women engaged in a longitudinal study of urinary leaking from first trimester to 12 months following birth provide the data for this paper. The prevalence of 30% of Australian women experiencing urinary leaking following pregnancy, were revealed. It is imperative that midwives engage in discussion and support prevention of this unwelcome outcome of childbirth.

**Abushaikha I.A. (2007).** the study was done to explore labor pain coping methods among Jordanian parturients. Descriptive statistics and content analysis were used to analyze data on demographics and coping methods from 100 low-risk parturient who were recruited from the postpartum unit in a major hospital in Jordan: Four labor pain-coping methods that included physiological, psychological, spiritual, and cognitive
coping were reported. The significance of childbirth education as a means to inform Jordanian women about coping with labor pain is emphasized. This study also highlighted the important roles that nurses and midwives can play as educators and supporters during pregnancy and labor.
Assessment of social support, albuminuria, Hb%, and occurrence of PIH.

**Fig. 1 SCHEMATIC REPRESENTATION OF CONCEPTUAL FRAMEWORK BASED ON WIDEN BACH'S THEORY**

**Study group:**
- Better maternal and perinatal outcome
- Less incidence of PIH
- Minimized complications

**Control group:**
- MOTHER: More complications, increased operative delivery, HELLP syndrome, APH, maternal death, prolonged labor, Obstructed labor.
- BABY: IUGR, LBW, SGA, preterm, stillbirth, IUD, Neonatal death

1st Day:
- Assessment of knowledge of self-care strategies in both groups

Follow up till delivery in both groups:
- Reinforcement of self-care strategies for 2 times at 4 weeks intervals in study group
- Assessments of level of adherence of self-care strategies in both groups after 4 & 8 weeks

Feed back:
- Self care strategies implementation in study group & routine care in control group
- Assessment of maternal, perinatal outcome & occurrence of PIH
Part – B  Literature related to conceptual framework based on Widen Bach helping art theory.

WIDENBACH’S HELPING ART THEORY

Introduction

Widen Bach proposes a prescriptive theory for nursing which directs action towards a goal. It consists of three factors. Prescription, central purpose and Realities. The nurse develops a prescription based on a central purpose and implements it according to the realities of the situation.

In the present Study, the “Central Purpose” is to reduce complications of a primigravidae. so the investigator developed the self-care strategies as a “Prescription” to implement it. ‘Realities’ is a outcome in terms of less complications for a mother and fetus.

Concepts of theory and application in a study

Widen Bach’s views nursing as an art based on goal directed care, nurse midwife should have factual and speculative knowledge judgment and skills for effective nursing practice. According to widen Bach. Nursing practice consists of identifying a Patient’s need for help, ministering the needed help and validating that the needed help was met or not.

Identification

This involves viewing a primigravidae and identifies the need of preventing complications. The background variables like age, education, occupation, type of work, habitance, Income, haemoglobin, albuminuria in each trimester and the level of knowledge on complications were identified.
Ministration

It refers to provision of needed help, self-care strategies that can be practiced by the women were implemented only to study group, after assessing their level of information and knowledge on antenatal care and self care strategies from both groups. Posttest of knowledge on antenatal care and self-care strategies was done in both groups as the control group received only routine care. Teaching and reinforcement of strategies were given after one month and again after one month during their visit only in experimental group. Level of practice on self-care strategies was assessed 2 times with 4 weeks interval in both groups. The reinforcement was given only to study group for 2 times.

Validation

It refers to a collection of evidence that shows a patient need have been met as a result of nursing action. Follow up of Antenatal mother and baby were done to assess for fetal complications like IUGR LBW, Preterm birth, Still birth, Mode of delivery and maternal complications like Eclampsia, HELLP syndrome, Abruptio placenta, etc. the conceptual frame work assumes that the mothers in study group will have minimal complications, when compared to control group. The...line indicates that the mothers in control group may have +ve outcome like study group or –ve outcome with more number of perinatal complications and more chance of getting PIH.

Assumption of this present study is that, if the mother follows self-care strategies regularly and adequately, there is a chance for less complication, which ultimately leads to healthy mother and healthy baby concept. If not, they end up in complications. So the conceptual framework is made based on the hypotheses of the study.