Factors associated with complications during pregnancy

العوامل المرتبطة بالمضاعفات خلال الحمل

Muna Abdul Kadhum Zeidan, M.Sc.*

* **Instructor, Community Health Department, College of Health and Medical Technologies , Middle Technology University, Baghdad, Iraq**
E:mail:muna_al_1982@yahoo.com

المستخلص

الهدف: الهدف من الدراسة هو تحديد العوامل التي لها علاقة بالمضاعفات خلال الحمل (كالعمر ،والعمر الحملي ،وعدد مرات الحمل،و فترة المباعدة بين حمل واخر، والتدخين).

المنهجية: دراسة مقطعية اجريت في المركز الصحي في الوشاش والمركز الصحي في باب المعظم لعينة غرضية وحجم العينة كان ٥٥٠ والدراسة قد بدأت في الاول من ابريل عام ٢٠١٤ ولغاية الاول من ابريل ٢٠١٥ . حيث جمعت البيانات باستخدام المقابلة المباشرة واستبانة معدة مسبقا للحصول على المعلومات الاجتماعية والديموغرافية.

النتائج: اظهرت نتائج الدراسة ان متوسط اعمار عينة الدراسة هو ٥و٢٦± ٣٩و٤ سنة ، وحوالي ٥٧.٨ % من العينة كن ربات بيوت ، وكانت العينة تشمل كل من ١٠٣ امراه حامل تعاني من تقلصات مبكرة في الرحم و ٩٨ من العينه تعاني من ارتفاع الضغط خلال الحمل و ٩٠ من العينه تعاني من اصابات المجاري البولية و ٨٠ من العينه تعاني من فقر الدم .

بعد تحليل النتائج بطريقة (الانحدار المتعدد) تبين وجود ترابط معنوي واضح بين مضاعفات الحمل و(العمر، والعمر الحملي، وعدد مرات الحمل،و فترة المباعدة بين حمل واخر، والتدخين) .

التوصيات: التثقيف الصحي الى جميع النساء الحوامل المراجعات لمراكز رعاية الأمومة والطفولة حول مخاطر المضاعفات خلال الحمل.

Abstract:

Objective (s): To determine factors associated with the pregnancy complications (Maternal age, education, obstetrical history, gravidity, birth space interval, and smoking).

Methodology: A cross-sectional study conducted at Al- washash & Bab-almoadham primary health care centers. The sample was (non probability convenient sample) which included (550) pregnant women. The study started from 1st April 2014 to 1st of April 2015. The data was collected by direct interview using special questionnaire to obtain socio-demographic information.

Results: the result shows that mean age of the subjects was 26.5± 4.39 years, 57.8% were housewives, the sample included 103 premature uterine contractions, 98 pregnancy induced hypertension , 90 urinary tract infection , and 80 anemic . Analysis of results by logistic regression test shows that (maternal age , gravidity, gestational age , birth space interval , and smoking) were significant factors associated with pregnancy complications.

Recommendations: health education to all attending pregnant women in MCH centers about risk of complications during pregnancy.

Key words: pregnancy complications, factors, hypermesis gravid arum, placenta.

Introduction

Acute complications of pregnancy can appear in all trimesters; their diagnosis and management are great challenges[1]. Factors affecting pregnancy outcome are socioeconomic status, smoking status and other health related conditions and behaviours[2]. Different types of early pregnancy complications are abortion, gestational trophoblastic disease, ectopic pregnancy and hyperemesis gravidarum. Abortion is the most common complication encountered during early pregnancy[3]. Pregnancy complications still pose a large and under-realized burden globally. Complications occur in approximately 40% of pregnancies worldwide, and can be severe in up to 15%[4]. Ectopic pregnancy is one of the common early pregnancy complication. It is another frequent, problem that poses a major health risk to women during child bearing years, and accounts for about information (age, education, gravidity, and birth space

9% of all pregnancy related deaths in the United States. [5]. In addition to significant maternal and fetal medical implications, high-risk pregnancies are associated with significant psychological consequences. In turn, maternal anxiety during pregnancy is associated with physical, cognitive, behavioural, and emotional problems in children and adolescents. [6,7,8,9]. Although the likelihood of experiencing anxiety in a high-risk pregnancy is likely influenced by pre-existing factors, including pre pregnancy mental health and the underlying reasons for being labelled high-risk, individual levels of anxiety may persist unnecessarily because of lack of knowledge of the normal pregnant state and the potential complications of pregnancy for which they are considered at risk. Every pregnant

herself or to her infant. Pregnancy related complications can not be reliably predicted [10].

Sampling

Al- washash & Bab-almoadham primary health care centers were chosen for this study and the design of the study was cross - sectional. The sample size was selected by 550 pregnant women .

. the data was collected by direct special questionnaire to obtained socio-demographic information (age, education, gravidity, and birth space interval, gestational age, complication during pregnancy, smoking).

Socio-economic status scales (SESS): SES is defined in terms of a standard sociological paradigm consisting of three components: (a) occupation; (b) education; and (c) income. The income component for this study is difficult to be obtained directly from the patients or their family. But the investigator attempts to calculate through the following objective indicators: Crowding index; house ownership; house expenses (properties) and possession of a car. Each item has scored according to its. importance and its score ranged from (150-89 and less) as the following: High score = 150-121, Middle score = 120-90 , Low score = 89 & less[11].

Statistical analysis:

woman faces the risk of sudden, unpredictable complications that could end in death or injury to Data was analyzed by SPSS package version 18, paired samples test, logistic regression test were calculated . The dependent variable of the logistic regression was the presence or absence of complications. A stepwise forward logistic But the regression was used . All variables were included in the initial analysis; the variable with the strongest association was estimated first, followed by all significant variables.

Result

Table (1) Distribution of sample accords to age, education, occupation , Socio economic status and pregnancy Complications

Age	Frequency	Percent
< 20	67	12.2
20-24	117	21.3
25-29	187	34.0
30-34	127	23.1
35-39	52	9.5
Mean age (26.5± 4.39)		
occupation	**Frequency**	**Percent**
employed	146	26.5
un employed	404	73.5
Total	550	100
Education	**Frequency**	**Percent**
Illiterate	56	10.2
read and write	92	16.7
primary school graduate	141	25.6
intermediate school graduate	103	18.7
High school graduate	83	15.1
college graduate	75	13.6
Total	550	100
Socio economic status	**Frequency**	**Percent**
Low	159	28.9
Moderate	291	52.9
High	100	18.2
Total	550	100
Complications	**Frequency**	**Percent**
Antepartum hemorrhage	33	6.0
Hypermesis gravidarum	60	10.9
Placental disorders	40	7.3
premature uterine contractions	103	18.7
pregnancy induced hypertension	98	17.8
gestational diabetes	46	8.4
urinary tract infection	90	16.4
Anemia	80	14.5
Total	550	100

Table (1) indicated that most of the mothers (34%) were in age group (25-29) years, (73.5%) were unemployed , (25.6%) were primary education and (52.9%) were of moderate socioeconomic status, the highest percentage of pregnancy complications in premature uterine contractions 18.7% followed by pregnancy induced hypertension 17.8 %, urinary tract infection 16.4%, anemia 14.5 % and Hypermesis gravidarum 10.9% respectively

Table (2) Relationship between pregnancy complications with Age

Age	pregnancy complications								
	Antepartum hemorrhage	Hypermesis gravidarum	Placental disorders	Premature uterine contraction	Pregnancy induced HT	Gestational diabetes	UTI	anemia	Total
<20	5 15.2%	8 13.3%	11 27.5%	5 4.9%	8 8.2%	6 13.0%	13 14.4%	11 13.8%	67 12.2%
20-24	6 18.2%	14 23.3%	16 40.0%	22 21.4%	23 23.5%	5 10.9%	18 20.0%	13 16.3%	117 21.3%
25-29	8 24.2%	16 26.7%	10 25.0%	4 43.7%	28 28.6%	21 45.7%	32 35.6%	27 33.8%	187 34.0%
30-34	9 27.3%	16 26.7%	3 7.5%	20 19.4%	31 31.6%	11 23.9%	14 15.6%	23 28.8%	127 23.1%
35-39	5 15.2%	6 10.0%	0 0%	11 10.7%	8 8.2%	3 6.5%	13 14.4%	6 7.5%	52 9.5%
Total	33 100%	60 100%	40 100%	103 100%	98 100%	46 100%	90 100%	80 100%	550 100%
T	3.767	4.177	8.32	8.587	6.827	4.767	7.884	8.033	
df	4	4	4	4	4	4	4	4	
Sig (2-Taild	.008	.006	.001	.002	.003	.001	.003	.001	

%= percent, T= paired samples test, df=degree of freedom, Sig.=level of significance, HT= Hypertension, UTI= Urinary Tract Infection, <=less than

Table 2 shows the significant association between pregnancy complications and age in this study. The age (25-29) years are more susceptible to complications of pregnancy and percentage was (34%).

Table (3) Relationship between pregnancy complications and Gestational age

%= percent, T= paired samples test, df=degree of freedom, Sig.=level of significance, HT= Hypertension, UTI= Urinary

Gestational age	pregnancy complications								
	Ante partum hemorrhage	Hypermesis gravidarum	Placental disorders	Premature uterine contraction	Pregnancy induced HT	Gestation diabetes	UTI	anemia	Total
1st (≤ 12 weeks)	23 69.7%	49 81.7%	4 10.0%	0 .0%	8 8.2%	5 10.9%	5 5.6%	5 6.3%	99 18.0%
2nd (≤ 13-24 weeks)	5 15.2%	5 8.3%	14 35.0%	6 5.8%	37 37.8%	17 37.0%	46 51.1%	46 57.5%	176 32.0%
3rd (≥ 25 weeks)	5 15.2%	16 0.0%	22 55.0%	97 94.2%	53 54.1%	24 52.2%	39 43.3%	29 36.3%	275 50.0%
Total	33 100%	60 100%	40 100%	103 100%	98 100%	46 100%	90 100%	80 100%	550 100%
T	3.443	5.558	4.567	5.053	5.518	5.566	4.556	3.554	
Df	6	6	6	6	6	6	6	6	
Sig (2- Taild	.003	.001	.003	.002	.001	.004	.001	.009	

Tract Infection, ≤ = equal to or less than, ≥= equal to or greater than

This table shows that women with gestational age (≥ 25 weeks) had higher rate of premature uterine contractions 94.2%, while 55% placental disorders. Results are highly significant as p- value was ≤ 0.000.

Table (4) Relationship between pregnancy complications and obstetric history

Gravid	Antepartum hemorrhage	Hypermesis gravidarum	Placental disorders	Premature uterine contraction	Pregnancy induced HT	Gestation diabetes	UTI	anemia	Total
1-2	10 30.3%	25 41.7%	13 32.5%	39 37.9%	47 48.0%	19 41.3%	33 36.7%	28 35.0%	214 38.9%
3-4	10 30.3%	23 38.3%	18 45.0%	37 35.9%	29 29.6%	20 43.5%	33 36.7%	30 37.5%	200 36.4%
>5	13 39.4%	12 20.0%	9 22.5%	27 26.2%	22 22.4%	7 15.2%	24 26.7%	22 27.5%	136 24.7%
Total	33 100%	60 100%	40 100%	103 100%	98 100%	46 100%	90 100%	80 100%	550 100%
T	-408	-335	3.086	3.022	2.34	1.339	-225	-307	
Df	3	3	3	3	3	3	3	3	
Sig (2- Taild	787.	838.	0.55	058.	096.	277.	837.	080.	

%= percent, T= paired samples test, df=degree of freedom Sig.=level of significance, HT= Hypertension, UTI= Urinary Tract Infection, > = greater than

Table 4 shows the association of pregnancy complications and the obstetric history in this study. The highest percentage of 3-4gravid was 45% placental disorders, followed by 43.5%and 38.3% in gestational diabetes and Hypermesis gravidarum respectively .

Table (5) Relationship between pregnancy complications with obstetric history

obstetric history / BSI (months)	pregnancy complications								
	Antepartum hemorrhage	Hypermesis gravidarum	Placental disorders	Premature uterine contraction	Pregnancy induced HT	Gestation diabetes	UTI	anemia	Total
<6	5 15.2%	7 11.7%	6 15.0%	11 10.7%	10 10.2%	7 15.2%	8 8.9%	5 6.3%	59 10.7 %
6-12	12 36.4%	20 33.3%	17 42.5%	39 37.9%	37 37.8%	15 32.6%	36 40.0 %	32 40.0 %	208 37.8 %
13-18	6 18.2%	16 26.7%	8 20.0%	22 21.4%	26 26.5%	7 15.2%	24 26.7 %	13 16.3 %	122 22.2 %
19-24	5 15.2%	13 21.7%	2 5.0%	23 22.3%	11 11.2%	9 19.6%	17 18.9 %	16 20.0 %	96 17.5 %
> 24	5 15.2%	4 6.7%	7 17.5%	8 7.8%	14 14.3%	8 17.4%	5 5.6%	14 17.5 %	65 11.8 %
Total	33 100%	60 100%	40 100%	103 100%	98 100%	46 100%	90 100%	80 100%	550 100%
T	4.556	4.587	5.587	4.556	3.55	2.366	3.087	5.568	
df	5	5	5	5	5	5	5	5	
Sig (2-Taild	.008	.009	.001	.003	.008	.007	.004	.003	

%= percent, T= paired samples test, df=degree freedom, Sig.=level of significance, BSI = Birth Space Interval , HT= Hypertension, UTI= Urinary Tract Infection, <= less than, >= greater than

Table 5 shows the significant association of pregnancy complications and the birth space interval, the months are more susceptible to complications of pregnancy and percentage was 37.8%.

Table (6) Relationship between pregnancy complications with Smoking

Smoking	pregnancy complications								
	Ante partum hemorrhage	Hypermesis gravidarum	Placental disorders	Premature uterine contraction	Pregnancy induced HT	Gestation diabetes	UTI	anemia	Total
Smokers	22 66.7%	36 60.0%	6 15.0%	72 69.9%	52 53.1%	35 76.1%	55 61.1%	40 50.0%	318 57.8%
Passive smokers	6 5.4%	14 12.7%	20 18.2%	11 10%	20 18.2%	5 4.5%	15 13.7%	19 17.3%	110 20%
Non smokers	5 4.1%	10 8.2%	14 11.5%	20 16.4%	26 21.3%	6 4.9%	20 16.4%	21 17.2%	122 22.2%
Total	33 100%	60 100%	40 100%	103 100%	98 100%	46 100%	90 100%	80 100%	550 100%
T	8.044	7.984	7.42	5.166	4.867	7.884	7.44	8.043	
df	4	4	4	4	4	4	4	4	
Sig (2-Taild	.001	.007	.006	.002	.008	.009	.002	.001	

%= percent, T= paired samples test, df=degree of freedom, Sig.=level of significance, HT= Hypertension, UTI= Urinary Tract Infection

Table 6 shows the significant association of pregnancy complications and smoking , the smokers are more susceptible to complications of pregnancy and percentage was 57.8%.

Table (7) logistic regression of risk factors of complications during pregnancy

Variables	B	S.E	Wald	df	Sig	Exp(B)	95% C.I. for EXP (B)	
							Lower	Upper
Age	.442	.164	6.434	1	0.008	1.604	1.151	2.255
Gestational age	-402-	.146	8.656	1	0.003	.696	.515	.865
Gravidity	.054	.299	.033	1	.416	1.056	.589	1.783
Birth space interval	-687-	121	35.393	1	0.000	.506	.407	.641
Smoking	-1.172-	.222	26.309	1	0.000	.312	.204	.495

B=Beta of Regression, S.E= Standard of Error, df=degree of freedom, Sig.=level of significance, Exp (B)= Exponential (Beta), C.I.= Confidence Interval

Table (7) shows that age , gestational age, birth space interval and smoking are significant risk factors for complications during pregnancy (p-value .008,.003, .000, and 0.000).

Discussion:

Pregnancy is a physiological state on the body and by itself makes women prone to many disorders and diseases. Coupled with the complications of pregnancy can have various severe deleterious effects on the health of the mother and the fetus. The finding of present study supported evidence is available in the study that reported the one woman die of pregnancy and childbirth related complications every minute, i.e. more than half a million every year[12].

In this study , most of the pregnant belongs to the age 25-29 years and the mean age of pregnant women was 26.5 ± 4.39 years. The finding of the present study is agreement with findings reported in North Ethiopia [13], and in Haiti [14]. This may be because the age group where the obstetric complications are usually less. This study shows that about (57.8%) of pregnant women were housewives, the finding of the present study is an agreement with finding , reported in North Ethiopia [13], found a high percentage (75.1%) of the pregnant women were housewives this could be a possible reason for women having health problem during their pregnancy [15]. Concerning women's education, most of them (25.6%) were accounted for primary school graduate maternal ,the same results were seen in North Ethiopia [13], and in Thailand [16]. This might be related to the fact that educated women have better power to make their own decision in matters related to their health and the expected expenses[13].

Regarding women's socioeconomic status, the results indicated that most of them (52.9%) were from moderate socioeconomic class. the same result were seen in Nepal [17],and in Bangladesh [18],found women who died from pregnancy-related causes, research from Nepal also indicates that socioeconomic factors did not significantly impact the risk of death, possibly due to the severity of these conditions and the relatively uniform distribution of socioeconomic status in

rural areas [19], this might be explained by Lack of money and transportation is a barrier to seeking care as well as identifying and reaching medical facilities [13]. The money saved by woman or her family can pay for health services and supplies, vital for transport, or other costs such as loss of work. Likewise, if a woman can afford to pay for these costs, she is more likely to seek care [20]. Of the 550 women who decided to continue their pregnancy, there were 18.7% premature uterine contractions, 17.8% pregnancy induced hypertension , 16.4% urinary tract infection the result confirms the finding in Bangladesh [21], and in Bla,mali [22], An important aspect of assessing birth preparedness and its complication readiness is measuring spontaneous knowledge of essential danger signs of obstetric and newborn complications. Knowledge of the danger signs of obstetric complications is the first step in the appropriate and timely referral for essential obstetric care [20,23],The spontaneous knowledge of respondents about key danger signs is very low compared to other studies [20,22],which indicates the poor awareness of women and a possible high chance of poor outcome of pregnancy. This could be attributed to presence or absence of relevant intervention to promote Birth Preparedness and Complications Readiness, utilization of health care services and information given during Antenatal care visits. The increased risk of this complication was most likely to have resulted from poor nutritional habits and low calorie intake by teenage mothers[24].

The present study shows that highest percentage obtained by pregnant women of 25-29 years age and (45.7%) had gestational diabetes with p-value <0.000. The results confirms the finding in Pakistan[25], in Haiti [16], and in Kenya [26]. This may be because the extreme ages of reproductive years are well know risk factors for complications during pregnancy.

The present study shows that (50%) of pregnant women had gestational age 3rd ≥ 25 weeks and 94.2% had premature uterine contractions. The results confirms the finding in Haiti [14], in Bangladesh [18], and in Thailand [16]. They found increased risk of preterm labour may be due to poor nutrition, inadequate antenatal care and lower levels of education[27].

Gravidity has significant association with complications at p-value <0.05. This study shows that (38.9%) of pregnant women had 1-2 gravid and 48% had pregnancy induced hypertension this result was similar to study conducted in North Ethiopia [13], and in India[28]. and in Pakistan [29], they found Women with parity 2 to 4 were more likely to be prepared for birth/complication than grand multiparas (more than four deliveries) and primipara (first deliveries). This may be related to over confidence about the experience of childbirth by the grand multipara and lack the knowledge and experience for birth preparedness by the primiparous women.

Birth space interval was significant association with complications at p-value <0.05, the finding of the present study is in agreement with findings that reported in India[28]. and in Pakistan [29],

they found Biological factors such as adverse obstetric history and null parity, which have been associated with risk of complications this could be explained by the highest risk factor which affects on pregnant and fetal health status.

The present study shows that pregnancy smokers had higher rate of gestational diabetes about 76.1% this result confirms the finding in Thailand [16], this may be because smoking during pregnancy is an important cause of ill for both mother and fetus it increase risk of placental complications.

Recommendations

Antenatal care clinics should give due emphasis to preparation for birth and its complication and provide information and education to all pregnant women. Multi media health education of people about risk of pregnancy complications.

Further study is needed to be conducted on a larger simple and different geographical settings to generalize the results of the study.

References

1-Marx JA, Hockberger RS, Walls RM, editors. Rosen's emergency medicine: concepts and clinical practice. 6th ed. Philadelphia:Mosby; 2006.

2-Mandelson MT, Maden CB, Daling JR. Low birth weight in relation to multiple induced abortion. Am J Public Health 1992; 82:391-4.

3-Virk J, Zhang J, Oslen J. Medical abortion and the risk of subsequent adverse pregnancy outcomes. N Engl J Med 2007;357:648-53.

4-Wardlaw T, Maine D. Process indicators for maternal mortality programmes. In: Berer M, Sundari T, editors. Safe motherhood initiatives: critical issues, reproductive health matters. Oxford: Blackwell Science; 1999. p. 24–30.

5-Centres for Disease Control end Prevention. Current trends ectopic pregnancy - United States, 1990-1992. Atlanta: Centres for Disease Controlend Prevention; 1995.

6- Buss C, Davis EP, Hobel CJ, Sandman CA. Maternal pregnancy-specific anxiety is associated with child executive function at 6–9 years age. Stress 2011;14:665–76.

7- O'Connor TG, Heron J, Golding J, Beveridge M, Glover V. Maternal antenatal anxiety and children's behavioural/emotional problems at 4 years. Report from the Avon Longitudinal Study of Parents and Children. Br J Psychiatry 2002;180:502–8.

8- Loomans EM, van der Stelt O, van Eijsden M, Gemke RJ, Vrijkotte T, den Bergh BR. Antenatal maternal anxiety is associated with problem behaviour at age five. Early Hum Dev 2011;87:565–70.

9- Cookson H, Granell R, Joinson C, Ben-Shlomo Y, Henderson AJ. Mothers' anxiety during pregnancy is associated

with asthma in their children. J Allergy Clin Immunol 2009 Apr;123:847–53.e11.

10-JHIPEGO. Maternal and neonatal health (MNH) program. Birth preparedness and complication readiness: A Matrix of shared responsibilities. MNH; 2001.

11- Tiwari S, Kumar A.,(2005) "Development of standardization of a scale to measure socio-economic status in urban and rural communities in India" Indian. J. Med, 122,p. 309-314.

12- The World Health Report (2005). Make every mother and child count. WHO.

13- Mihret Hiluf, Mesganaw Fantahun, Birth Preparedness and Complication Readiness among women in Adigrat town, north Ethiopia, Ethiop.J.Health Dev. 2008;22(1): 1-5.

14- Frank W.J. Andersona, , Sujata I. Naika, Shingairai A. Feresu, Bette Gebrian, Manju Karki, Sioban D. Harlow, Perceptions of pregnancy complications in Haiti, International Journal of Gynecology and Obstetrics (2008) 100, 116–123.

15- Nesimi A. , Mustafa O, Aytul Z., Fehmi O. Anaemia prevalence and its affecting factors in pregnant women of Is parta Province. Biomed Res (India) 2004; 16 (1): 11-14.

16- Nahathai Watcharaseranee, Pitcha Pinchantra, Somkid Piyaman, The Incidence and Complications of Teenage Pregnancy at Chonburi Hospital, J Med Assoc Thai , 2006 , Vol. 89 Suppl. 4 :s118-s121.

17- Sood S, Chandra U, Mishra P, Neupane S. measuring the effects of behavior change interventions in Nepal with population-based survey results. Maternal and neonatal health, Johns Hopkins Bloomberg school of Public Health, Center for communication programs; 2004.

18- Shegufta S Sikder, Alain B Labrique, Abu A Shamim, Hasmot Ali, Sucheta Mehra, Lee Wu, Saijuddin Shaikh, Keith P West Jr and Parul Christian, Risk factors for reported obstetric complications and near misses in rural northwest Bangladesh:
analysis from a prospective cohort study, Sikder et al. BMC Pregnancy and Childbirth 2014, 14:347.

19- Christian P, Katz J, Wu LS, Kimbrough-Pradhan E, Khatry SK, LeClerq SC: Risk
factors for pregnancy-related mortality: a prospective study in rural
Nepal. Public Health 2008, 122(2):161–172.

20- JHIPEGO. Maternal and neonatal health (MNH) program. Birth preparedness and complication readiness: A Matrix of shared responsibilities. MNH; 2001.

21- Khanum P, Quaiyum MA, Islam A, Ahmed S. Complications of pregnancy and childbirth: Knowledge and practices of women in Rural Bangladesh, ICDDR, B: Centre for health and population research, Mohakhali, Dhaka 1212, Bangladesh; 2000, ICDDR, B Working Paper No. 131. Thaddeus S and D Maine. Too far to walk:
maternal mortality in context. Soc Sci Med 1994;38 (8):1091-1110.

22- Smith K, Dmytraczenko T, Mensah B, Sidibe O. Knowledge, attitudes, and practices related to maternal health in Bla, Mali: Results of a baseline survey, May 2004.

23- JHPIEGO. Maternal and neonatal health. Monitoring birth preparedness and complication readiness, tools and indicators for maternal and newborn health. Johns Hopkins, Bloomberg school of Public Health, Center for communication programs, Family Care International; 2004. Available at: http://pdf.dec.org/pdf_docs/PNADA619.pdf.

24- Berenson A,Wieman C,Mccomb S.Adverse perinatal outcomes in young adolescents.J Reprod Med 1997; 42: 559-64.

25- Meharunnisa Khaskheli, Shahla Baloch and Aneela Sheeba Baloch, Risk Factors in Early Pregnancy Complications. Journal of the College of Physicians and Surgeons Pakistan 2010, Vol. 20 (11): 744-747.

26- Renay Weiner, Carine Ronsmans, Ed Dorman, Hilton Jilo, Anne Muhoro, & Caroline Shulman, Labour complications remain the most important risk factors for perinatal mortality in rural Kenya. Bulletin of the World Health Organization 2003, 81 (7).

27- Suebnukarn K, Phupong V.Pregnancy outcomes in adolescent < 15 years old.J Med Assoc Thai 2005; 88: 1758-62.

28- Mishra US, Ramanathan M: Delivery-related complications and determinants of caesarean section rates in India. Health Policy Plan 2002, 17(1):90–98.

29- Khan S: Maternal Health: A Study of Individual and Community Factors Related to Care Seeking and Maternal Mortality in Pakistan. In Phd Thesis. Baltimore, MD: Johns Hopkins Bloomberg School of Public Health, Department of International Health; 2010.