

Health Information Seeking Behaviour among Hypertensive Disorder In Pregnancy (HDP) High Risks Antenatal Mothers

This article was published in the following Scient Open Access Journal:

Women's Health & Gynecology

Received August 13, 2016; Accepted October 03, 2016; Published October 10, 2016

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Abstract

Background: Provision of good maternal healthcare should be incorporated with early risks screening, given prompt management based on evidence-based medicine according to acceptable technological standard which is affordable at each appropriate level of care. Health education is delivered with aim to help its management process. Health information seeking behaviour of the antenatal mothers facing with risks should be examined to prevent antecedents for bad outcomes. This study aims to measure the prevalence of health information seeking behaviour among the hypertensive disorder in pregnancy (HDP) risk antenatal mothers and its influencing factors.

Methods: A cross sectional study was conducted among antenatal mothers with HDP risks. Multistage random sampling technique was used to select respondents from health centres in one of the district that showed highest maternal death cases reported in Malaysia. Self-administered questionnaire covered the socio-demographic, health information seeking behaviour, health information seeking needs for HDP, barriers in health information seeking, coping style and self-efficacy were used.

Results: There were 360 respondents with high risk HDP were screened from 2207 antenatal mothers attended at selected health centres. Result showed that the prevalence of antenatal mothers at risk for HDP was 16.31% (n=360). Prevalence of high risk antenatal for HDP with good health seeking information behaviours was only 51.1%. Higher household income (crude odds ratio 2.38, CI 1.51-3.74), having tertiary education (crude odds ratio 1.84, CI 1.21-2.81), no previous obstetric history, low barrier in health information search (crude odds ratio 2.44, CI 1.60-3.74), good monitoring behaviour (crude odds ratio 1.64, CI 1.05-2.54) and high self-efficacy (crude odds ratio 2.41, CI 1.58-3.68) have good health information seeking behaviour. However, respondents' perception on health information needs related to HDP was found not significant. Multiple logistic regression showed that respondents with high income (>RM 2300) (adjusted odds ratio 2.12, CI 1.17-3.86), low health information seeking barrier (adjusted odds ratio 1.83, CI 1.14-2.94) and high self-efficacy (adjusted odds ratio 1.83, CI 1.14-2.92) had good health information seeking behaviour.

Conclusion: Concerted effort to deliver relevant health information to HDP risk group should start as early in pre-pregnancy care to all reproductive women.

Keywords: Health information seeking behaviour, HDP, Antenatal mother

Introduction

Seeking health information that leads to psychosocial adjustment of the risk known to one's health is an important strategy in health promotion. Pregnancy is often viewed as a "natural" process. Despite that fact, worldwide, 342,900 women die each year from pregnancy and pregnancy-related causes [1]. Maternal misperception of antenatal risks leads to poor judgement which is detrimental to the women's pregnancy outcome. It also reduces the antenatal mother's motivation to seek health information. Examples of maternal health problems encountered during pregnancy are diabetes mellitus, postpartum haemorrhage, obstetric embolism, puerperal sepsis, complications of respiratory diseases, heart diseases in pregnancy and others. Hypertensive Disease in Pregnancy (HDP) is one of the priority maternal health problems whereby the signs, symptoms or antenatal health risks can be misperceived and it could lead to both foetal and maternal morbidity and mortality which is preventable.

During pregnancy, antenatal care is the care that a woman receives to ensure healthy outcomes for her new born and herself [2,3]. There are potential benefits that

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can obtain from the antenatal care. The antenatal period presents opportunities for reaching pregnant women with a number of interventions that may be crucial to their health and well-being and that of their infants [2]. Besides, it is an opportunity to educate the women and families about danger signs, symptoms and risk of labour in order to plan for delivery. The antenatal care can be used to supply information about birth spacing which is one of the important factors to improve infant survival and maternal health. The World Health Organization (WHO) guidelines also specified the timing and content of antenatal care visits according to gestational age [2,3].

During the antenatal visit, antenatal mothers will be designated to either in the high risk or low risk pregnancy group depending on their present risk factors. All antenatal mothers received health information when seen by the health care providers regardless of the antenatal risks. This is because the antenatal risks is not static throughout the gestation as it may change according to circumstances and hence during every follow up the risk assessment will be conducted by the health provider. The most common strategy of delivering health information by the skilled health providers is in groups or individually. Usually one way didactic provision of information is given with minimal feedback or counterchecking whether patient has understood the information.

However, there are problems encounter during the health consultation with health care providers. Previous research about satisfaction during antenatal visit shows that there is a component of dissatisfaction about communication between health staff and the expectant mothers [4]. Dissatisfaction expressed is mainly related to the process of imparting health knowledge and lack of information during antenatal clinic visits.

In a local study assessing patient satisfaction in antenatal clinic showed that about 52.6% of respondents suggest the doctors to be more talkative to patients and 41.3% suggest the doctors to give explanation about anything related to pregnancy [5]. This shows that the antenatal mothers do not receive adequate information about their pregnancy. In Tanzania, even though the coverage of ANC is 98%, less than half of all women seen received information about pregnancy complications [6]. Providers of health care impose barriers to communication by stereotyping and generally disregarding information requests [7]. Another barrier of communication is that physicians and midwives also expected that the antenatal mothers would accept their advice without question and this patronizing communication has proven to be counterproductive for doctor-patient relationship [8].

Sometimes with heavy workload and long waiting time, routine health information was not delivering to patients adequately. In a study done to assess adequacy of information of oral health in diabetics given by the dental hygienist found that health information on healthy lifestyle topics and diabetes related oral health topics were not routinely provided to the diabetic patients [9]. Another study in United States among the African-American pregnant women found that poor understanding of symptoms and potential complications related to preeclampsia [10]. Women who did not seek timely care may have poor understanding of the signs and symptoms of preeclampsia and put them at a greater risk for poor preeclampsia-related outcomes [11]. Hence, by exploring where antenatal mothers turn for information related to pregnancy and medical problems during pregnancy and how accurate and effective this sources is an important matter to be explored.

Unsatisfactory health information content received during ANC can lead to mothers seeking health information elsewhere. Besides verbal manner of health information dissemination by the health care providers, the health information may be obtained by means of pamphlets, brochures or from information in hand held maternal health record. By understanding the methods used by antenatal mothers in health information search process, researchers and health care providers will be able to identify strategies to make health information accurate and accessible. Besides studying to improve on the efficacy and accuracy of patients' queries, improvement in the methods by which information is provided directly to the patients can be recommended as well.

Health information seeking is a proxy for health seeking behaviour. Health information seeking field is about how people look for information and to create interventions to aid in their searches for information acquisition. Therefore information seeking can positively impact on individual's morbidity and mortality. Based on Confidential Enquiry of Maternal Deaths in Malaysia, from 2009-2011, 15.8% of maternal death were due to HDP and its complication [12]. HDP is one of the commonest causes of maternal death after medically associated conditions (31.2%) and obstetric embolism (16.0%) [12].

Present study, focus on high risks HDP antenatal mothers' health information seeking behaviour (HISB). Another reason for choosing HDP is due to increasing incidence rates in developing countries [13]. This trend is related to increasing rates of the risk factors such as rising rates of obesity, delayed child bearing, increasing use of in-vitro fertilization and pregnancies that are being complicated by coexisting medical conditions. Therefore, there is a need to assess the current health information seeking of antenatal mothers because late presentation of HDP can lead to maternal death which is preventable. The risk factors to develop HDP are as follows [14]:

1. Existing chronic medical disorders such as obesity, hypertension, diabetes mellitus, renal disease, connective tissue disease and thrombophilia
2. Previous history of preeclampsia or eclampsia or intrauterine growth restriction (IUGR) or unexplained stillbirth
3. Family history of preeclampsia or eclampsia or hypertension
4. Extremes of reproductive age (maternal age below 20 years and above 40 years old)
5. Multiple gestations
6. Excessive weight gain (more than 1 kilogram per week)

In Malaysia, antenatal care is available in both government and private set up of hospitals and clinics. In government sector, the antenatal clinics are run by trained doctors and nurses and supervised by the Family Medicine Specialists. Referrals can be made to tertiary hospital if needed. All antenatal mothers are provided with maternal health record (MHR) which need to be documented the pregnancy progress [15]. In Malaysia, routine antenatal care includes identification of risk factors, health and laboratory screening and counselling. Malaysia has been using the risk approach system for antenatal care since 1989 [16]. This system grades all antenatal mothers according to the

level of severity of risk factors. Details about the colour coding system can be referred elsewhere [16]. Patients will be given health information from the health care provider, either during consultation or information imparted during group counselling.

There is abundance of biophysical and biochemical tests to identify women who are at increased risk for future development of preeclampsia [17,18]. Unfortunately, these biochemical markers have limited sensitivities and are expensive to use clinically. Risk assessment is carried out during antenatal visit and patient are labelled as high risk or low risk to develop potential health problems during pregnancy or otherwise. Nonetheless, being categorized as lower risk is not an assurance as well. Optimal care hinges on the patient participation. Patients who participate by asking questions or search for health information appreciate the severity of their health status. They are more likely to bring forward their information findings to present to health facility for confirmation of symptoms that they experienced. This will enable earlier preventive measures being done for example referral to appropriate level of care. This is important because even though the occurrence of HDP cannot be prevented, early recognition and prompt treatment can prevent the occurrence of both maternal and foetal morbidity and mortality [14]. At the moment there is no study which concentrates on the patient's information seeking and its associated factors among antenatal mothers with high risks for HDP. By conducting this study, ways for optimal care for health information dissemination for antenatal mothers can be determined. Information given by means of counselling is part of effective clinical outreach and education efforts. Thus, this study aims to measure the health information seeking behaviour and its influencing factors among at HDP risks antenatal mothers.

Methods

A cross sectional study design involving antenatal mothers that seeks ANC in one of the highest maternal deaths districts was chosen. All antenatal mothers were screened for risk factors. Antenatal mothers with any of the risk factors to develop HDP are considered as high risks. The risk factors are based on the Training Manual Hypertensive Disorder in Pregnancy developed by National Technical Committee Confidential Enquiries into Maternal Deaths [14] and Clinical Practise Guideline on Hypertension [19]. The risk factors that predispose antenatal mothers to have HDP have been listed above. Inclusion criteria includes resident of selected district and whose copy of handheld maternal record available in the clinic. Based on National Health Morbidity Survey IV [20], Negeri Sembilan is one of the states in Malaysia that

have high prevalence of known hypertension. The district with highest antenatal cases and maternal mortality was Seremban. There are ten government health clinics that offer antenatal care and all are selected for the study. Systematic sampling was administered from each clinic and fifty per cent of antenatal cases were selected. The estimated antenatal case gathered was based on previous total antenatal cases seen in the same month. Only selected antenatal mothers recruited as systematic sampling were used. Variable definitive operation: Health Information Seeking Behaviour (HISB) was defined as the action a pregnant woman takes to search for pregnancy health information through various sources. Data were collected via validated self-administered questionnaire. Data analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive analysis used frequencies, numbers, mean and percentages were performed. Respondents were divided to two groups based on the median cut-off of each scale. Respondents were labelled as poor if their score of each scale was below the median value. Those who scored above the median value of each scale were classified as good group. The scales measured the Health Information Seeking Behaviour (HISB), Health Information Seeking Needs (HISN), Health Information Barriers (HIB), coping style and self-efficacy. Therefore there are dichotomous grouping of HISB, HISN, HIB, coping style and self-efficacy. Logistic regression was used to determine predictors of health information seeking behaviour between the independent variables.

Results

In total 2207 antenatal cards were screened using the HDP risk assessment checklist to identify high risk group for HDP. However, only 360 cards fulfilled the inclusion criteria. Prevalent of high risk mothers was 16.3%. Based on the risk factors, 74.4% has at least one risk factor for HDP. The first three commonest risks were diabetes (47.2%) followed by obesity 37.2% and overweight 13.9%. There were 360 respondents with high risk of HDP risks were selected to fill up the self-administered questionnaire. The mean age of respondent was 30.2 years old. The mean household income was RM 3510. Majority, 76% of the respondents were Malay. Nearly half of the respondents had either secondary education or tertiary level of education. As for the employment status, 39.7% were housewives. Majority of the respondents had own transportation. The mean gestational age during booking was 10.6 weeks. Majority of the respondents, 72.7% were non primigravida and from those had pregnant previously, 12.7% had history of HDP. About 21.4% had family history of HDP. Table 1

Needs	Disagree		Unsure		Agree	
	n	%	n	%	n	%
Clinical symptoms	16	4.4	60	16.7	284	78.9
Maternal risk factors	14	3.9	49	13.6	297	82.5
Foetal risks	16	4.4	46	12.8	298	82.8
Treatment options	9	2.5	48	13.3	303	84.2
Recurrence risk for future pregnancy	12	3.3	74	20.6	274	76.1
Steps taken when experiencing warning signs eg headache	8	2.2	36	10.0	316	87.8
Complications to mother/ baby	10	2.8	38	10.6	312	86.7
Long term impact to mother	19	5.3	64	17.8	277	76.9
Long term impact to baby	18	5.0	84	23.3	258	71.7
Medications (name/side effects)	15	4.2	77	21.4	268	74.4
How to deal with emotional impact when diagnosed with hypertension	9	2.5	60	16.7	291	80.8

Table 1: Health Information Needs regarding Hypertension Disease in Pregnancy (HDP), (n=360).

showed the health information needs of HDP among the high risks antenatal mothers. In general, respondents agree there is a need on health information about hypertension in pregnancy. From the table, all the HDP information was perceived required and the percentage was more than 70%. However, a small percentage of respondents, 5.3% did not agree on the information on long term health impact to the mothers. About 23.3% were not sure about the health information on long term impact of hypertension to the baby. This shows some of the respondents are unexposed on the fact of the long term health impact of hypertension towards mothers and baby.

Table 2 showed the bivariate and multivariate analysis by using good HISB as the outcome. Result showed household income and education level was significantly associated with

good health information seeking behaviour (HISB). Analysis showed 58% of the respondents that have high household income ($\chi^2 = 14.31, p < 0.005$) and 59.2% that have high education level ($\chi^2 = 8.28, p < 0.004$) was associated with good HISB. Obstetric factors such as gravida status, past history of HDP and family history of HDP have no significant association with good HISB. Among the respondents, 62.9% of them who had been grouped as low HIB ($\chi^2 = 17.25, p < 0.05$), 55.2% of respondents with monitoring behaviour ($\chi^2 = 4.83, p = 0.028$) and 61.7% respondents with good self-efficacy ($\chi^2 = 16.85, p < 0.05$) were significantly associated with good HISB. Multiple logistic regression analysis showed respondents with high household income (>RM 2300) were twice likely to have good HISB compared to low household income (odds ratio 2.12, 95% CI: 1.17-3.86), those with low barrier were twice likely to have good HISB compared with those with high

Variables	Bivariate analysis				Multiple logistic regression		
	HISB		z	P value	Odds ratio (95% C.I.)		p value
Good n(%)	Poor n(%)						
Age	30.23±5.3	30.26±6.24	0.267	0.789	0.97 (0.93-1.02)	-0.31	0.171
Booking gest. age	9.93±5.36	9.73±5.26	0.204	0.838	1.01 (0.97-1.06)	0.014	0.513
Household Income							
High	141 (58.0)	102 (42.0)	14.31	0.00*	2.12 (1.17-3.86)	0.75	0.013
Low	43 (36.8)	74 (63.2)			1.00		
Race							
Non Malay	46 (53.5)	40 (46.5)	0.26	0.613	1.31 (0.77-2.24)	0.27	0.323
Malay	138 (50.4)	136 (49.6)			1.00		
Housewife							
Yes	68 (47.6)	75 (52.4)	1.20	0.273	1.32 (0.77-2.27)	0.28	0.312
No	116 (53.5)	101 (46.5)			1.00		
Education level							
Tertiary	100 (59.2)	69 (40.8)	8.28	0.004*	1.28 (0.76-2.16)	0.25	0.353
Non tertiary	84 (44.0)	107 (56.0)			1.00		
Own transport							
Yes	166 (52.2)	152 (47.8)	1.30	0.257	1.18 (0.57-2.45)	0.17	0.660
No	18 (42.9)	24 (57.1)			1.00		
Parity							
Primi-gravid	53 (53.0)	47 (47.0)	0.20	0.657	1.28 (0.73-2.24)	0.24	0.381
Multi-gravid	131 (50.4)	129 (49.6)			1.00		
Past history of PIH							
Yes	21 (63.6)	12 (36.4)	2.65	0.103	2.04 (0.90-4.62)	0.71	0.087
No	110 (48.5)	117 (51.5)			1.00		
Family history of PIH							
Yes	46 (59.7)	31 (40.3)	2.92	0.088	1.26 (0.72-2.20)	0.23	0.422
No	138 (48.8)	145 (51.2)			1.00		
Health Information Needs							
High	130 (54.4)	109 (45.6)	3.07	0.080	1.03 (0.63-1.70)	-0.03	0.945
Low	54 (44.6)	67 (55.4)			1.00		
Health Information Barrier							
Low	105 (62.9)	62 (37.1)	17.25	<0.05*	1.83 (1.14-2.94)	0.60	0.013
High	79 (40.9)	114 (59.1)			1.00		
Coping styles							
Monitoring	132 (55.2)	107 (44.8)	4.83	0.029*	1.35 (0.83-2.18)	0.30	0.230
Blunting	52 (43.0)	69 (57.0)			1.00		
Self-efficacy							
High	113 (61.7)	70 (38.3)	16.85	<0.05*	1.83 (1.14-2.92)	0.60	0.013
Low	71 (40.1)	106 (59.9)			1.00		

Table 2: Bivariate and multiple logistic regression analysis according to Health Information Seeking Behaviour (HISB) level.

information barrier (odds ratio 1.83, 95%CI: 1.14-2.94) and those with high self-efficacy were twice likely to have good HISB compared to those with low self-efficacy (odds ratio 1.83, 95% CI: 1.14-2.92). A predictor model analysis showed that the variables studied contributed to 15.6% of the determinants of good HISB among HDP risk antenatal mothers.

Discussion

The fact that presence of minimum risk factors, which was 74.4% among the respondents, was equivalent to the study done locally at pre-pregnancy care clinic assessment [21] whose showed prevalence of at least one high risk factor present was 68.8%. In both studies, the sample population was from antenatal mothers who attended ANC in government health clinics. The prevalence of high risk antenatal mothers seen during ANC was 16.3. Socio-demographic factors such as age was found to have no significant association with good HISB. This finding rejected hypothesis that younger age had good information seeking behaviour than the aged. Possible explanation was this study population age was from the reproductive age only. This study found that primi-gravida status was not associated with good HISB. Elsewhere, primigravida were found to have good HISB compared to multigravida [22]. Therefore this has implication during ANC, whereby health information during pregnancy should be given repeatedly regardless of their gravidity status. Furthermore past obstetric history of HDP and family history of HDP were found to have no significant association with good HISB. Therefore these findings stressed the importance of repeated health information parting despite had previous gravidity, obstetric or family history status.

Further analysis of the data showed that information from family members or friends was trusted compared to health professionals. This means that the social circle of the patients (community at large) have to be equipped with skills of information search of reliable sources. This means there is a need to teach the community starting from young age the way to search reliable health information. However, facilities such as transportation, internet, and libraries should be in place by the Malaysian government so that there is always access to the information. Study done among HIV cases noted that these specific group preferred getting information from people and considered people the most trustworthy, useful, understandable, and available information sources and they not rated internet as preferable sources but it was preferred by those with more education or living in metropolitan areas [23].

It was noted that high risk antenatal mothers with low information barrier had good HISB. This finding was similar to the previous studies [24,25] which focussing at a group of population with specific disease. Findings from this study also show "monitoring" (coping) behaviour is associated with good HISB which showed parallel to findings of other studies. This is because patients with monitoring behaviour are more likely to search for information and alert with their health cues. Result also showed that high self-efficacy was associated with good HISB.

Conclusion

This cross sectional study was carried out to determine the factors that influence HISB among high risks HDP antenatal

mothers. The study was done at all ten government health clinics in Seremban district, Negeri Sembilan. The prevalence of HDP risks antenatal mothers was 16.3. Respondent were found to consult health information more from their family members or friends as compared to the health care provider. The respondents wanted to know almost all the health information needs regarding HDP. In this study, primigravida status has no significant association with good HISB which has an implication during clinical consultation. Findings of information barrier, coping styles and self-efficacy added more light to the existing literature on information seeking. However present study only able to demonstrate 15.6% of the variables for good HISB. Further study is recommended to look at the health information needs of HDP risks antenatal mothers. Concerted effort to deliver relevant sources to HDP risk group should start as early in pre-pregnancy care to all reproductive women and also to the community. Active patient participation during patient-doctor meeting should be strengthening. Furthermore, study done earlier also highlighted that the best accomplished health information transfer knowledge should be using 6-point call to action approach by collaborating the practitioners, investigators, funders, non-governmental organizations and policy makers on a set of articulated and comprehensive goals [26]. Health information delivery through a community coordinated approach, advocacy organization involvement and collaboration with available care provider organization will benefit to diverse population needs.

Our population has right to access and obtain health information related to their needs but in identifying those who are at risk for further preventive measure, they need to be educate with effective way of health communication and patient education. As highlighted in the book by the Committee on Health Literacy, Board [27], they are 5 key components need to be follow:

1. Do not assume a patient's literacy level or understanding based on her appearance.
2. In both oral and written communication, use plain, nonmedical language.
3. Speak slowly.
4. Organize information into two or three components.
5. Ask the patient to "teach back" information to confirm understanding

Recommendation

It is recommended that patient coping style is analysed first before information is parted. Patient satisfaction is increased if information is given out according to their coping style during consultation. Health information dissemination to the patients as well as comprehensive existent source of information need to be streamlined in the clinic and social media for easy access especially on risks potential for mother and child mortality. There should be a guideline for health information dissemination for diseases common for maternal mortality and morbidity. The platforms for health dissemination outside clinic settings should be evaluated for their effectiveness. There are many platforms where health information can be disseminated besides the clinic set up. In Malaysia, health information can be imparted through Young Doctors program which is run by Ministry of Education. As for the youth there is the National Service Training Program run

by the federal government. Another platform is the premarital course which is compulsory to attend especially for the Muslims. All programs or courses have at least one session on health. The National Population and Family Development Board (NPFDB) has also set up various adolescent centres known as Kafe@ Teen whereby youth can use the facilities provided free of charge. One of the components of the centre is adolescent reproductive health services and counselling besides skill building activities. The community at large can undergo health screening performed by trained volunteers in the community whereby health information are provided.

References

1. Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5. *Lancet*. 2010;375(9726):1609-1623.
2. World Health Organization (WHO)/United Nations Children's Fund (UNICEF). Antenatal Care in Developing Countries: Promises, Achievements and Missed Opportunities, an Analysis of Trends, Levels and Differentials, 1990-2001. *Geneva*. 2003.
3. World Health Organization. Working with Individuals, Families and Communities to Improve Maternal and newborn health. *WHO Geneva*. 2010.
4. Ghobashi M, Khandekar R. Satisfaction among Expectant Mothers with Antenatal Care Services in the Musandam Region of Oman. *Sultan Qaboos Univ Med J*. 2008;8(3):325-332.
5. Pitaloka D, Rizal AM. Patients' satisfaction in antenatal clinic hospital Universiti Kebangsaan Malaysia. *J Community Health*. 2006;12(1):9-18.
6. Von Both C, Fle S, Makuwani A, Mpembeni R, Jahn A. How much time do health services spend on antenatal care? Implications for the introduction of the focused antenatal care model in Tanzania. *BMC Pregnancy Childbirth*. 2006;6:22.
7. Lukoscheka P, Fazzarib M, Paul Marantz P. Patient and physician factors predict patients' comprehension of health information. *Patient Educ Couns*. 2003;50(2):201-210.
8. Tsigas EZ. Preeclampsia: The Patient Perspective. NIH's National Institute of Child Health and Human Development (NICHD) workshop. *Preeclampsia: A Pressing Problem*. 2006.
9. Yuen HK, Mountford WK, Magruder KM, et al. Adequacy of oral health information for patients with diabetes. *J Public Health Dent*. 2009;69(2):135-141.
10. You W, Wolf M, Bailey SC, et al. Factors associated with patient understanding of preeclampsia. *Hypertension in Pregnancy*. 2010;31(3):1-9.
11. You WB, Wolf M, Bailey SC, et al. Factors associated with patient understanding of preeclampsia. *Hypertension in Pregnancy*. 2012;31(3):341-349.
12. Ministry of Health Malaysia. Report on The Confidential enquiries into maternal deaths in malaysia. 2015.
13. Dolea C, AbouZahr C. Global burden of hypertensive disorders of pregnancy in the year 2000. *World Health Organization Geneva*. 2003.
14. Ministry of Health Malaysia. Training Manual Hypertensive Disorders in Pregnancy. *National Technical Committee Confidential Enquiries into Maternal Deaths*. 2014.
15. Leny, SS, Shuhaila A, Sutan R. Usage of Home Based Maternal Health Record in antenatal monitoring among Malaysian women attended Universiti Kebangsaan Malaysia Medical Centre. *MJPHM*. 2013;13(1):1-10.
16. Ravindran J, Shamsuddin K, Selvaraju S. Did We Do It Right? An Evaluation of the Colour Coding System for Antenatal Care in Malaysia. *Med J Malaysia*. 2003;58(1):37-53.
17. Karthikeyan VJ, Gregory YH, Lane DA, Blann AD. Angiogenin and apoptosis in hypertension in pregnancy. *Pregnancy Hypertens*. 2011;1(3-4):191-196.
18. Martel MJ, Rey E, Beauchesne M, et al. Use of short acting β_2 agonists during pregnancy and the risk of pregnancy-induced hypertension. *J Allergy Clin Immunol*. 2007;119(3):576-582.
19. Ministry of Health Malaysia. Clinical Practice Guideline: Management of Hypertension. 3rd edition. 2008.
20. Institute for Public Health (IPH). National Health and Morbidity Survey 2015 (NHMS 2015). Vol II: Non-Communicable Disease, Risk Factors and Other Health Problems. 2015.
21. Nik Mazlina M, Ruziaton H, Nuraini DB, et al. Risk factors of women attending pre-pregnancy screening in selected clinics in Selangor. *Malays Fam Physician*. 2014;9(3):20-26.
22. Shieh C, McDaniel A, Ke I. Information-Seeking and its Predictors in Low-Income Pregnant Women. *J Midwifery Womens Health*. 2009;(5)54:364-372.
23. Hogan TP, Palmer CL. Information preferences and practices among people living with HIV/AIDS: results from a nationwide survey. *J Med Libr Assoc*. 2005;93(4):431-438.
24. Gee ME, Bienek A, Campbell NR, et al. Prevalence of, and barriers to, preventive lifestyle behaviors in Hypertension (from a National Survey of Canadians with Hypertension). *Am J Cardiol*. 2012;109(4):570-575.
25. Kyeung Mi Oh, Gary L. Kreps, Jungmi Jun, Elizabeth Chong, Lolita Ramsey. Examining the Health Information-Seeking Behaviours of Korean Americans. *J Health Communication*. 2012;17(7):779-801
26. Tsigas E, Magee, LA. Advocacy organisations as partners in pre-eclampsia progress: patient involvement improves outcomes. *Best Pract Res Clin Obstet Gynaecol*. 2011;25(4):523-536.
27. Nielsen-Bohman L, Panzer AM, Kindig DA, editors. Health literacy: a prescription to end confusion. Committee on Health Literacy, Board on Neuroscience and Behavioral Health, Institute of Medicine. *The National Academies Press*. 2004;345.