The Relationship between Health Locus of Control, Knowledge and Adherence to Antihypertensive Regimen among Woman with Preeclampsi

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Abstract Pregnancies complicated by hypertension are associated with increased risk of adverse fetal, neonatal and maternal outcomes. Adherence to therapy is a potent factor in determining the success of a treatment regimen which is affected by determinant factors, high importance of it is the level of knowledge regarding health circumstance and health locus of control. Therefore, this study aimed to identify the relation between knowledge, health locus of control and adherence to antihypertensive regimen among women with preeclampsia. Design a descriptive correlation methodology was used, where a convenient sample of 150 women had preeclampsia, were selected from the outpatient clinic at El Shat by Maternity University Hospital in Alexandria. Tools: two tools were used to collect data; tool1 pregnant women's knowledge and adherence interview schedule and tool 11 multiple health Locus of Control scale. Results clarified that 39.2% of external powerful health locus of control (EPHLC) and 27.3% of internal health locus of control (IHLC) had good total score of knowledge about preeclampsia and its therapeutic regimen.in contrast 70% of women with chance health locus of control (CHLC) had poor knowledge with a statistically significant difference between them (P=0.008). In addition, women with EPHLC had the highest percentage of adherence to the antihypertensive regimen (40.4%) as compared with "IHLC" (29.4%), however women with "CHLC" had the lowest level of regimen adherence (20%), with a statistically significant difference P =0.002. A statistically significant difference was found between the different dimensions of HLC and women's adherence to antenatal checkup. Antihypertensive medication. Urine & hematological analysis and blood pressure checkup in favor of external powerful others health locus of control P= <0.05. In conclusions, pregnant women who adopted external powerful others' health locus of control was significantly had more knowledge and more adherents to the antihypertensive regimen than those who adopted internal and external chance health locus of control. Thus, researcher recommended for Articulating health educational programs based on the health locus of control beliefs for mothers using health promotion models that emphasize on (definition, signs, and symptoms, causes, complication on the mother and fetus) to improve adherence to the antihypertensive regimen.

Keywords: *health locus of control, adherence, antihypertensive regimen, woman with preeclampsia*

1. Introduction

Gestational Hypertension (GH) is the most common medical condition encountered during pregnancy, Occurring in approximately 6–8% of pregnancies. The hypertensive disorders of pregnancy cover a spectrum of conditions, including gestational hypertension chronic hypertension preeclampsia and eclampsia. Gestational hypertension is diagnosed in women whose blood pressure reaches $\geq$ 140/90 mmHg for the first time during pregnancy (after 20 weeks gestation), but without proteinuria. Mild preeclampsia is defined as new onset of sustained elevated blood pressure after 20 weeks of gestation in a previously normotensive woman ($\geq$140 mmHg systolic or $\geq$90 mmHg diastolic on at least two occasions 6 h apart) Proteinuria of at least 1+ on a urine

dipstick or $\geq$300 mg in a 24-h urine collection after 20 weeks of gestation. However severe preeclampsia classified as Blood pressure $\geq$160 mmHg systolic or $\geq$110 mmHg diastolic. Urinary protein excretion of at least 5 g in a 24-h collection, Neurologic disturbances (visual changes, headache, seizures, coma) Pulmonary edema Hepatic dysfunction (elevated liver transaminases or epigastria pain) Renal compromise (oliguria or elevated serum creatinine concentration; $\geq$1.2 mg/dL is considered abnormal in women with no history of renal disease) Thrombocytopenia. While eclampsia refers to seizures in a preeclamptic woman that cannot be attributed to other causes [1,2]. Virtually (GH) associated with increased risk of adverse fetal, neonatal and maternal outcomes, including preterm birth, intrauterine growth restriction (IUGR), perinatal death, abruption placentae, disseminated, intravascular coagulation (DIC) antepartum & postpartum hemorrhage, acute renal failure, hepatic

failure and maternal and neonatal deaths [1,2]. Approximately Ten million women develop preeclampsia each year around the world. Worldwide about 76,000 pregnant women die each year from preeclampsia and related hypertensive disorders. In addition, the number of babies who die from these disorders is thought to be on the order of 500,000 per annum[3]. In developing countries, a woman is seven times more likely to develop preeclampsia than a woman in a developed country. From 10-25% of these cases will result in maternal death [3,4].

Consistent control of blood pressure requires that pregnant woman to follow the anti-hypertensive regimen. This regimen includes various behavior and lifestyle changes for maintaining a proper diet, engaging in regular physical activity or exercise, blood pressure monitoring, and efficiently taking prescribed medications. The concept of adherence is choice and mutuality in goal setting, treatment planning, and implementation of the regimen. Whereas adherence signifies that the patient and physician collaborate to improve the patient's health by integrating the physician's medical opinion and the patient's lifestyle, values, and preferences for care. This implies that both patients and providers mutually establish treatment goals and medical regimen. As well as they continue to take a prescribed medication. Scientifically adherence has been defined as the degree to which a patient's voluntary behavior corresponds with the clinical recommendations of health care providers[5]. Adherence signify that patients are self-sufficient individuals who assume an active and voluntary role in defining and achieving goals for their medical treatment.[2,6]. In fact, the degree of adherence with medication regimes averages 50%, while with recommended lifestyle modifications has been found to be as low as 10%. 3,4. the finding of [7] suggests that in order to increase adherence to the antihypertensive regimen, it is important to predict a psychosocial variables and individual's motivation to achieve the treatment goals. These predictors may include personal health locus of control orientation, health beliefs, socio- demographic characteristics, knowledge about the disease, and. the complexity of regimen [5,6]

The health locus of control theory was developed by Rotter [7]. The concept "locus of control" refers to the belief individuals have for control they have over their lives. In fact control orientation, which describes to what extent one's actions are instrumental to goal attainment, was first measured in Rotter's health locus control scale. Indeed, health locus of control is comprised of two components, internal locus of control and external locus of control. An individual with an internal locus of control believes that outcomes are a direct result of their own behavior. An individual with an external locus of control believes that outcomes are a result of either chance or powerful other people, such as physicians [8,9]. Therefore [7] reported that Social Learning Theory elucidates locus of control as a generalized expectancy that is applicable in situations in which an individual has not had enough experience in a particular behavior or task to develop specific expectancies [10,11]. Therefore, the locus of control is applicable in more general or novel situations such as per eclampsia –eclampsia and gestational diabetes.

The health locus of control theory is used to assess adherence to therapeutic regimen in some studies.

According to Ref, [12] an individual with high perceived control may have better health because they are more likely to take health-enhancing actions. This would suggest that enhancement of an individual perceived control over their health may lead to improved personal health. Thus, in caring for women with pre-eclampsia, it is substantial for health care providers to recognize the level of knowledge about the hypertensive disorder during pregnancy and their health locus of control orientation which had a great influences on adhering to antihypertensive therapeutic regimen. consequently preventing health hazards, and manage complications in a long-term and life-long perspective, for both the woman and her baby [13,14].

2. Significance of the Study

Individual beliefs about health, illness and health care are important as they guide a person's self-care measures and care seeking behavior., adequate self-care in following antihypertensive regimen will decreases the lethal complications and death of mothers and her fetus. Thus, in caring for women with pre eclampsia, it is important to understand their health locus of control which is considered as one of the underlying psychological constructs that may influence women's health behavioral and emotional functioning. Furthermore, it is important for health care providers to recognize pregnancy as a time to implement health education aimed at promoting health preventing hazards, and manage complications in a long-term and life-long perspective, for both the woman and her baby [8,10].

Although some researchers [9,15] emphasized that holding internal health locus of control are associated with better adherence to self-care regimens than external H LC., This is not always true, as others have found opposite results. Poor adherence to antihypertensive regimen has been found among hypertensive patients with high IHLC. In fact studies focusing on health beliefs including health locus of control and adherence to antihypertensive regimen among women with pre eclampsia are lacking. Therefore, this study was conducted to determine the relationship between knowledge, health locus of control and adherence to anti-hypertensive regimen among women with pre eclampsia

3. Aim of the Study

This study aimed to assess the relationship between knowledge, health locus of control, and adherence to the antihypertensive regimen among women with preeclampsia

3.1. Research Question

What are the relationships between pre-eclamptic women's Health Locus of Control and adherence to the anti-hypertensive regimen?

What is the relationship between pre-eclamptic women's knowledge and adherence to the anti-hypertensive regimen?

4. Materials and Method

4.1. Study Design

A descriptive correlation design was followed in this study.

4.2. Research Setting

This study was conducted in the outpatient clinic at El Shatby maternity university hospital

4.3. Subjects

A convenience sampling technique was used in collecting the data. A total of one hundred and fifty pregnant women (determined by Epi-info 7 software programs) attending the previously mentioned setting was included in the study. The inclusion criteria included. Pregnant woman having mild to moderate preeclampsia for not less than two months, age between 20-35,. Free from other medical diseases and accepting to participate in the study.

4.4. Tools

Two tools were used in this study:

Tool 1: basic data, knowledge and adherence to antihypertensive regimen structured interview schedule: it was developed by the researcher It entails three main parts of questions:

Part I: Basic data questions: it includes data about the subject's general characteristics such as age, level of education, and clinical data as pattern of ante natal checkup, Pregnancy planning status, Reaction to the diagnosis

Part 11: preeclamptic women's knowledge regarding the antihypertensive regimen structured interview schedule. It comprised of 30 items under six main groups of questions as follows: General knowledge about the disease (N=4) needed analysis (N=5), Diet regimen (N=6). Healthy lifestyle (N=5) Antihypertensive medication (N=6). Antenatal checkup (N=4) questions, Subjects 'response to each item was varied between incorrect answer (1), correct but incomplete (2), correct and complete (3). The total score was range between30-90 Subjects' knowledge were ranked as: -Poor for a total score of <50, Fair for a total score of 50-<70, Good for a total score of ≥70

Part III: preeclamptic women's adherence to the hypertensive regimen structured interview schedule. Which measure the adherence over the past month days This part comprised of 24 items under five main groups of questions that cover subjects' adherence, namely: 1-urine and hematological analysis(N=4), 2-healthy die(N=4), 3-anti-hypertensive medication (N-8), 4-antenatal checkup(N=3), and 5- a healthy lifestyle(exercise &rest, sleep)(N=).(Answers on women's adherence were rated on two points. A score of (2) was given to adherence; non-adherence is given a score of (1). The total scores ranged between "24-48." Those who scored "≥36" were considered adherents, while those who scored "<36-24" were considered non-adherents.

Tool 11: Multidimensional Health Locus of Control scale (MHLC)

It was developed by (Wallston, 1978) [16] and it was modified by the researchers to suit the Egyptian society. The scale measures the different dimensions of HLC among gestational hypertensive women. It consists of three subscales; each of them composed of six items, namely, internal Health Locus of Control (IHLC), External Powerful Others Health Locus of Control (EPHLC), and External Chance Health Locus of control (ECHLC). Answers are rated on a six-point Likert- scale ranging from 1 (strongly disagree) to 6 (strongly agree). The range of the possible score on each subscale is 6 to 36. Respondents were classified according to their sub-scale score for subscale scores for which the highest, i.e., the higher the locus of control score, the greater the tendency to believe in that controlling source. The

4.5. Method

Approval was obtained from the Ethical Committee of the faculty of nursing- Alexandria University and then from responsible authorities of the study setting. Tool I was developed by the researcher after the extensive review of the relevant and recent literature. While tool II was adapted and modified to fit with the present study subjects. Arabic translation of the study Tools II was done. The tools were later validated by 5 experts in the related fields. The reliability of tool I& II was accomplished by split-half reliability technique. The scale has high internal consistency with Cronbach's alpha tool I part II=0.827part III=0.759and tool III= 0.815. A pilot study was carried out on 15 women, who were excluded from the study subjects to ascertain the relevance feasibility, clarity of tools, as well as detect any problem peculiar to the statements and to estimate the time needed to complete it. Following the pilot study, the tools were corrected accordingly and made ready for use. Subjects were individually interviewed by the researcher using the study tools. Data collection covered a period of five months, from the beginning of February to June 2015.

Ethical considerations: - For each recruited subject the following issues will be considered: Securing the subject's informed consent, keeping the subject's privacy, assuring the subjects of their data confidentiality, and the right to withdraw at any time

4.6. Statistical Analysis

Statistical analysis was performed using SPSS version 20 for Windows. Frequency and percentage were used for describing and summarizing categorical data. Chi-Square test and Monte Carlo test were used to compare comparison between different variable. Pearson coefficient was conducted to find a correlation between knowledge score, adherence scores and different dimension of health locus of control. The significance of the results was judged at the 5% level.

5. Results

Table 1 illustrates the relationship between health locus of control among preeclamptic women and their socio-demographic characteristics. Around two-fifths of (59.3%) had external powerful others' health locus of control (EPHLC) compared to 34% who perceived events to be a

result of internal health locus of control (IHLC) & 6.7% for external chance health locus of control (ECHLC). It was noted that EPHLC (48.3%) was more encountered among preeclamptic women in the age group > 30, illiterate (58.4%), and housewives (73%). Urban residence (58.4%). On the other hand, around two-fifths of those with IHLC orientation (60.8%) aged between "30 to 35 years," 43.1% had secondary school or high education, and 60.8% living in the extended family. Accordingly, HLC was found significantly related to the woman's age,

educational level, residence, family income and family type (P<0.05).

Table 2 shows the relationship between HLC among preeclamptic women and their clinical data. It was noted that EPHLC was a common feature among women who had planned pregnancy (70.8%), who regularly visited antenatal clinic (71.9%), and accepted the disease (77.5) compared to 31.4%, 25.5% and (37.3%)respectively of women with IHLC. HLC was found significantly related to planning status, the number of antenatal visits, and reaction to the diagnosis (P=<0.05).

Table 1. Distributions of preeclamptic women according to their general characteristics and their health locus of control (HLC)

| General characteristics | Preeclamptic women's health locus of control | | | | | | Total | |
| | Internal | | External chance | | External powerful others | | | |
	No=51	34 %	No=10	%6.7	No=89	%59.3	No	%
Age (Years):								
> 35	12	23.5	2	20	19	21.3	33	22
30-35	31	60.8	8	80	27	30.4	66	44
< 30	8	15.7	0.0	00.0	43	48.3	51	34
P	X^2=29.68- P=0.0001*							
Level of Education								
illiterate	8	15.7	6	60	52	58.4	66	44
< Secondary school	21	41.2	1	10.00	15	16.9	37	24.7
≥ Secondary school	22	43.1	3	30	22	24.7	47	31.3
P	X^2 FET =24.53 P0.0001*							
Work status								
House wives	14	27.5	8	80.0	65	73	87	77.3
Workers	37	72.5	2	20.0	24	27	63	22.7
P	X^2 FET =21.61,P=0.0001*							
Residency								
Rural	13	25.5	3	30	37	41.6	53	35.3
Urban	38	74.5	7	70	52	58.4	97	64.7
P	χ2/FET =12.372, p=0.059*							
Type of family								
Nuclear	20	39.2	8	80.0	41	46.1	69	46
Extended	31	60.8	2	20.0	48	53.9	81	54
P	X^2 FET = 8.118*, MC p=0.017							
Family income								
Enough	39	76.5	4	40.0	69	77.5	112	74.6
Not enough	12	23.5	6	60.0	20	22.5	38	25.4
P	X^2 FET =16.52- P=0.003*							

X^2: Chi square test FET: Fisher Exact Test *: Significant values at <0.05 *significant at P≤0.05.

Table 2. Relationship between clinical data and health locus of control among the studied preeclamptic women

| Clinical data | preeclamptic women's health locus of control | | | | | | Total | |
| | Internal | | External chance | | External powerful others | | | |
	No=51	34 %	No=10	%6.7	No=89	%59.3	No	%
Pattern of ante natal visit								
regular	13	25.5	2	20.0	64	71.9	79	52.7
Irregular	38	74.5	8	80	25	28.1	71	47.3
P	X^2 FET =16.773- P=0.002*							
Pregnancy planning status								
Planned	16	31.4	3	30	63	70.8	82	54.7
Unplanned	35	68.6	7	70	26	29.2	68	45.3
P	X^2 FET =11.32,- P= 0.021*							
Reaction to the diagnosis								
Accepted	19	37.3	7	70	69	77.5	95	63.3
Not accepted	32	62.7	3	30	20	17.8	55	36.7
P	X^2 /FET =6.58 –P=0.045*							

X^2: Chi square test FET: Fisher Exact Test *: Significant values at <0.05 *significant at P≤0.05.

Table 3 shows the relationship between HLC among preeclamptic women and their clinical data. It was noted that EPHLC was a common feature among women who had planned pregnancy (70.8%), who regularly visited antenatal clinic (71.9%), and accepted the disease (77.5 compared to 31.4%, 25.5% and (37.3%)respectively of women with IHLC. HLC was found significantly related to planning status, the number of antenatal visits, and reaction to the diagnosis (P=<0.05).

Table 3. Relationship between the knowledge of pre-eclamptic women regarding antihypertensive regimen and their health locus of control (HLCO)

Knowledge about antihypertensive regimen	Preeclamptic women's health locus of control						Total	
	Internal		External Chance		External powerful others			
	No=51	34 %	No=10	%6.7	No=89	%59.3	No	%
Knowledge about disease								
Good	6	11.8	0.0	0.0	8	9	14	9.3
Fair	18	35.3	2	20	51	57.3	71	47.3
Poor	27	52.9	8	80	30	33.7	65	43.4
p	χ2/FET =8.532, P =**0.004***							
Urine & hematological analysis								
Good	18	35.3	0.0	0.0	10	11.2	28	18.7
Fair	13	25.5	2	20	45	50.6	60	40
Poor	20	39.2	8	80	34	38.2	62	41.3
P	χ2/FET =15.100*, p=0.006							
Diet								
Good	21	41.2	0.0	0.0	25	28.1	46	30.7
Fair	16	31.4	4	40	39	43.8	59	39.3
Poor	14	27.5	6	60	25	28.1	45	30
P	χ2/FET =10.854*,P=0.043*							
Health life style								
Good	22	43.2	0.0	0.0	24	27	46	30.7
Fair	17	33.3	1	10	45	50.6	63	42
Poor	12	23.5	9	90	20	22.4	41	27.3
P	χ2/FET =9.498,=0.052*							
Antihypertensive Medication								
Good	13	25.5	1	10	48	53.9	62	41.3
Fair	21	41.2	2	20	19	21.3	42	28
Poor	17	33.3	7	70	22	24.8	46	30.7
p	χ2/FET =10.796*, =0.063*							
Antenatal check up								
Good	8	15.7	0.0	0.0	50	56.2	21	14
Fair	21	41.2	3	30.0	26	14.6	50	33.3
Poor	22	44.3	7	70	13	29.2	79	52.7
P	χ2/FET =17.592*, p=0.002							
Total score of knowledge								
Good	19	27.3	0	0.0	35	39.2	54	36
Fair	15	39.4	3	30	32	36	50	33.3
Poor	17	33.3	7	70	22	24.8	46	30.7
P	X2 /FET =16.354 -P=0.008*							

X^2: Chi square test FET: Fisher Exact Test *: Significant values at <0.05 *significant at P≤0.05.

Table 4: In general, women with "External HLC" had the highest percentage of satisfactory adherence to antenatal checkup (70.8%) than those with "Internal powerful HLC" (35.3%). On the other hand, women with "CHLC" had the lowest satisfactory adherence (20%). There was a statistically significant difference between the three dimensions of HLC p=0.001. Women with "external HLC" were more satisfactorily adherence to anti-hypertensive medication (64%), urine and hematological analysis (59.6)the BL P checkup (52.8%), The littlest percentage of satisfactory adherences was with the dietary regimen (22.5%). As regards those with "Internal HLC," a high percentage of women with "IHLC" had a satisfactory adherence with the dietary regimen (64.7%), healthy lifestyle (60.8%) then antihypertensive medication(52.9%). The tiniest percentage of satisfactory adherences was with urine and hematological analysis (29.4%). Among women with "ECHLC," their highest satisfactory adherence was with the administration of the antihypertensive medication (40%), and antenatal checkup(20%) and diet (20%), the least satisfactory adherence was with the healthy lifestyle (10.%).Around one-thirds of subjects with "IHLC" (64.7%) had satisfactory adherence to the dietary regimen. Compared to only (22.5%) of EPHLC and "(20%). ECHLC" A statistically significant difference was found between the different dimensions of HLC and women's total score of adherence, where p= 0.002*in favor of external PHL.

Table 4. Relationship between the adherence of preeclamptic women regarding antihypertensive regimen and their health locus of control (HLCO)

Adherence	Pre-eclamptic women's health locus of control						Total N=150	
	Internal		External Chance		External powerful others			
	No=51	34 %	No=10	%6.7	No=89	%59.3	No	%
Urine & hematological analysis								
Adherence	15	29.4	2	20.0	53	**59.6**	70	46.7
Non adherence	36	70.6	8	80.0	36	40.4	80	53.3
P	X^2 FET =21.25- p=<0.001.*							
BLP check up								
Adherence	16	31.4	1	10	47	**52.8**	64	56.7
Non adherence	35	68.6	9	90	42	47.2	86	57.3
P	. $\chi2$/FET =11.827, p = 0.006*							
Diet								
Adherence	33	**64.7**	2	20	20	22.5	55	36.7
Non adherence	18	35.3	8	80	69	77.5	95	63.3
P	X^2 /FET =14.65P= 0.007*							
Health life style								
Adherence	31	**60.8**	1	10	28	31.5	60	40
Non adherence	20	39.2	9	90	61	68.5	90	60
P	X^2/FET =15.2P= 0. 006*							
Antihypertensive medication								
Adherence	27	**52.9**	4	40.0	57	**64.**	88	58.7
Non adherence	24	47.1	6	60.0	32	36	62	41.3
P	X^2/FET =13.181 -P=0.007*							
Antenatal check up								
Adherence	18	35.3	2	20.0	63	**70.8**	75	50
Non adherence	33	64.7	8	80.0	26	29.2	75	50
P	X^2/FET =14.25,P= 0.001*							
Total score of adherence								
Adherence	15	29.4	2	20.0	36	**40.4**	53	35.3
Non adherence	36	70.6	8	80.0	53	59.6	97	64.7
P	X^2/FET =10.65 –P=0.002*							

X^2: Chi square test FET: Fisher Exact Test *: Significant values at <0.05 *significant at P≤0.05.

Table 5. Relationship between knowledge, health locus of control of the study subjects and Adherence to antihypertensive

Health locus of control, knowledge	Adherence score	
	r	P
Total Knowledge score	**1.15**	**1.035***
Health locus of control dimension		
IHLC	0.99	0.984
EPHLC	**1.07**	**1.078***
ECHLC	0.86	.0.672

Table 5 illustrates the relationship between health locus of control, knowledge and Adherence to antihypertensive regimen among woman with preeclampsia Negative Pearson correlation coefficient between IHLC, ECHLC and their adherence to antihypertensive regimen among the study subjects P=0.984, P=.0.672respectively.on the other hands, a positive Pearson correlation coefficient was evident between adherence and EPOHLC P=1.078*. As expected significant Pearson correlation coefficient between level of knowledge and adherence was noted P=1.035*.

6. Discussion

Adherence to therapy is a potent factor in determining the success of the antihypertensive regimen among preeclamptic women. It is a complex behavioral process and is related to woman's knowledge and beliefs about their illness, their motivation to manage it, confidence in their ability to engage in illness-management behaviors, expectations regarding the outcome of treatment, and knowledge of the consequences of poor adherence. Therefore, women with pre-eclampsia are expected to carry out a set of complex, self-management behaviors directed at controlling their disease. [17,18] These women usually vary considerably in relation to their knowledge and adherence to the antihypertensive regimen. In this respects locus of control has been recognized as an important domain that affects both knowledge and adherence to the therapeutic regimen among preeclamptic women. Indeed [19] explore that locus of control mediates any actions taken to prevent health problems. It correlates positively with conformity, attitude change, and achievements. Therefore, this study evaluated the relationship between pre-eclamptic woman's' knowledge, locus of control, and its effects on adherence to the antihypertensive regimen in Egypt as a developing country .

The results highlight that about two-thirds of the study subjects had external health locus of control, mainly in the form of powerful others, with little of chance HLC followed by a little more than one-third of them having internal health locus of control. This may be explained by the preeclamptic woman feel that they are not responsible for their illness, thus, they develop either the external

powerful others or an external chance HLC. Accordingly [20,21] believe that the outcome of associated disease during pregnancy as pre-eclampsia is the responsibility of health care providers especially doctors and generally leave their care in the hands of the medical professionals. Additionally, "powerful others" health locus of control which is displayed by the study subjects, indicates that they are more likely to believe that professionals or others outside themselves determine their illness successes or failures. This result was supported by [22] who showed that the women with gestational hypertension obtained higher scores on the "powerful others" and "chance" subscale of the multidimensional health locus of control scale. As such his results showed that pregnant women with preeclampsia are more likely than normotensive pregnancy to believe that the health of their unborn baby is a function of powerful others, namely the health care providers. Consequently, they were more complying with their diabetic regimens. This is true for the current study, but only for the powerful others. However, [23] emphasize that once the woman is pregnant; the health of the woman and fetus becomes the focus of attention. Their concerns are often related to the health and well-being of the baby as the mother feels a moral commitment and exaggerated responsibility towards the baby.

Significantly [22] added that during pregnancy, the prevailing feelings of uncontrollability appear to be, predominant to the extent that they believe that powerful others have more control on their condition. As such they seek to have more knowledge and adhere to the therapeutic regimen than IHLC. Indeed [18] asserted that during pregnancy, the prevailing feelings of uncontrollability appear to be predominant; the women are more likely to believe in professionals or others outside themselves to control their condition and determine their illness successes or failures. Therefore, the external powerful others HLC could serve to protect themselves by avoiding responsibilities by making them less likely to attribute the control over desired outcomes to their own behaviors, and more likely to blame external forces[15]. Likewise [23] added that women perceived Powerful Others HLC during pregnancy as a result of psychological distress.

It seems that culture variation has significant differences associated with, HLC, and positive health behaviors. Ref [24] observed in developing countries most of the women adopt internal HLC and they are keen to adhere to therapeutic regimen. they are more tended to value collectivism, had greater personal autonomy and takes great responsibility for their successes and failures about health to a large extent. In contrast [25] suggested that the social structure in various Arab societies tends to remain male dominated. Consequently, women who grow up in such a society may develop a higher external sense of control among the woman. Some other studies suggested that a many of societal, cultural and religious factors are reflected in MHLC. Indeed, societies that value individual choice over family or community propensity were found to rate higher on "Internal HLC.

Conversely [22] reported that people with an internal HLC take responsibility and decisions without any form of influence from the external world, are more likely to adhere to prescribed treatment regimens because they believe in their ability to influence their health. In contrast,

Externally-driven people are thought to be less likely to adhere to therapy because of the belief that their actions may not appreciably affect health outcomes. The discrepancy between the present study results and this finding is related to externality feel that her health and unborn baby are the responsibility to the health care profession. So they follow their recommended therapeutic regimen. On the other hands, the internality feels the power to protect their health by themselves. [18] On the other hands, [26] had reported that the participant adopted internally followed by externally HLC. They posited that the relationship between locus of control and health protective behaviors as a whole point to an internal locus of control as a mediating factor for any action taken to prevent health problems. besides that internally oriented patients seek information, see themselves as responsible for maintenance or improvement of their physical health, know more about conditions that cause poor health, and are more likely to take steps to improve or maintain their health, engage in health-protective behaviors, cope adequately with illness, and have good adherence to a medical regimen.

Concerning the study subjects' knowledge about antihypertensive regimens, two-thirds of the subjects with IHLC have good and fair knowledge as compared to about three-quarter of subjects with EPHLC. While, the poor total score of knowledge was associated with ECHLC with a statistically significant difference. This finding is unexpected because more than two-fifths of the IHLC as compared to about one-quarter of EPHLC had secondary school education or more while three-fifths of EPHLC were illiterate. Contradictory finding was reported by [27]. They stated that education is the process of influencing behavior and producing changes in knowledge, attitudes and skills required to manage problems related to the disease. In this respect, Ref [28] stated that individual with internal expectancies is more likely to be more educated and working, for that they are alert to those aspects of the environment which provide useful information regarding their disease for their healthy behavior.

Results reveal a significant difference between externally oriented and internally-oriented preeclamptic woman for knowledge and adherence to the antihypertensive regimen. This supports the hypothesis that there would be a significant effect of locus of control and level of knowledge on adherence to the antihypertensive regimen, such that external powerful others woman had greater knowledge than the internally- and ECHLC oriented woman. Yet about three-fifths of EPHLC and less than three-quarter of IHLC do not adhere to their therapeutic regimen. Whereas the lower level of IHLC knowledge about preeclampsia reflects lower adherence to the therapeutic regimen. This finding can be attributed to the fact that EPHLC had regular antenatal care, so they acquire more knowledge about preeclampsia and its therapeutic regimen than the IHLC. In addition, they accepted associated preeclampsia with pregnancy, therefore, they follow physician recommendation for the sake of better health for themselves as well their unborn child. The lower adherence among the internally oriented can be explained as they feel the power to control hypertension by their own, as some woman sought to use complementary and alternative therapies. In contrast, the chemical compositions of the medications were perceived

to be causing the adverse effects on the mother as well unborn baby health. Therefore they demotivated to follow the medical regimen with the low expectancy of its outcomes. On the contrary[29] explicit that Internally-oriented patients are more likely to engage in positive health behaviors and engage in preventive health care activities generally have good health, cope adequately with illness, and had good adherence to a medical regimen prescribed.

In the current study, although, those with "External powerful others HLC" had a significantly Good total score of knowledge than the internally oriented bout the disease, however, the internally oriented had more tendency to have good knowledge about diet, and healthy lifestyle, which are the core aspects of gestational hypertension control. Actually, they recognized the benefits of, maintaining proper weight, practicing physical exercise, which positively affected adherence to some aspects of the treatment regimen. Similarly, this is supported by [30] they mentioned that Internally-oriented feels they control the progressive of the disease by themselves through following healthy therapeutic regimens. Contrariwise the external chance HLC group in this study had a lower score of knowledge about therapeutic regimen than both internal and external powerful others groups. This may be explained by, external chance women who perceive their disease as a result of luck or fate would have less intention to acquire information and adhere to the therapeutic regimen .In contrast results of the present study also revealed that Knowledge about the disease itself was the poorest area of knowledge with no statistically significant difference among both internal and external powerful others groups. This finding is on the same line with [31] who found that knowledge about the disease was the poorest area of knowledge among patients who adopted both internal and external health locus of control. Most women with PIH lack appreciation of the need for medication, constant follow up visits and diet in the control of PIH. Instead, myths and misconceptions prevail, which leads to lack of general awareness and clients present to health centers when it is too late.

In this essence, this finding represents that although it's decisive for a preeclamptic woman to have adequate knowledge for best management and control their blood pressure, knowledge has not been shown to be a good predictor of adherence to the antihypertensive regimen However, and the study subjects had reasonable knowledge about their associated preeclampsia. Yet, they are not efficiently adhering to antihypertensive regimen incorporating the lifestyle changes needed to implement it over time. In this context [32,33] stressed that external PHLC believed that their predictive value may be best for adherence with short-term (during pregnancy) rather than long-term treatments As such these results showed that pregnant women with preeclampsia than normotensive pregnancy believe that the health of their unborn baby is the responsibilities of powerful others, namely the health care providers. Accordingly, they were more complying with their regimens. Correspondingly similar to the present findings, a study undertaken [34] showed that their participants with sufficient control of blood pressure levels had more knowledge about the disease reflects more adherence with an antihypertensive medication regimen. Contradicting [5] results reported that there is a vast gap

between self-care knowledge and preventive practices among pregnant women with gestational hypertensive. As the vast majority had adequate knowledge regarding antihypertensive regimen including lifestyle (low salt diet, exercise, rest and sleep) yet less than half who follow the recommended regimen.

As regards the adherence with the antihypertensive regimens, the EPHLC in the current study exhibit a higher adherence than the internally oriented group regarding antenatal checkup, blood pressure checkup, and medication therapy. This is in line with the results of [35] they stated that meetings and frequent appointments provide A key benefit of the greatest number of antenatal visits, better monitoring of blood pressure levels, as well as the opportunity to have more access to information, likewise, it could be a basis for adherence to guidelines on the medication therapy, provide more effective change in lifestyle and well-being of women. Contradictory findings were reported by [25] who mentioned that High external "others accounted for the non-adherence observed. Therefore, observing a significant relationship between the variables and non-adherence confirmed that patients had a reduced tendency to adhere to the prescribed treatment regimen because they believe they cannot affect their own health behavior precisely, the subjects of the present study with "powerful others HLC" were more adherent to their regimen than those with internally oriented HLOC, and "external chance HLC" were the lowest adherent to the antihypertensive regimen with a significant difference between the three dimensions of HLC. This is consistent with the results of. [36,37] who found that the hypertensive woman who had adequate knowledge, believe their health control lies with their physicians will be more likely to follow their physicians' instructions and turn decisions over to health workers that they think control their health.

The results of the present study also revealed that the women who adopted IHLC had more tendencies to adhere to dietary aspects of antihypertensive regimens than those who adopted EPHLC. This makes sense because people who adopted EPHLC, They may influenced by their social surroundings, and have less ability to resist temptation when it is present. (such as the presence of another person eating differently than oneself), ultimately they have difficulty for maintaining dietary adherence [38].

The general low adherence of the subjects could be attributed to the complexity of the therapeutic regimen. It is crucial that women with pre-eclampsia follow a strict treatment regimen in order to maintain control over their blood pressure. This regimen includes maintaining a proper diet, engaging in regular physical exercise, bed rest, and frequent blood pressure monitoring, and taking the prescribed medications on time. In fact, there are associated factors that affect the efficient use of antihypertensive regimen which specifically include poor provider-patient communication, inadequate knowledge about a drug and its use, not being convinced of the need for treatment, fear of adverse effects of the drug.This view is supported by [30,39] who pointed out that the complexity of the medical regimen were significant predictors of non-adherence. He emphasizes that a patient with a more complex regimen is less likely to be adherent than patient with a less demanding regimen. Another explanation could be that the women in the present study

may have low self-efficacy and social support and relation with health care providers.

Another explanation for the low adherence to therapeutic regimen by [39] elucidate that psychosocial factors, such as locus of control, are helpful in explaining non-adherence in medication regimens. They reported that individuals with higher self-efficacy scored attributing their health outcomes to their personal control and show more health seeking behaviors. Furthermore [40], reported that people who scored highly on Powerful Others HLC generally believed that their physician could control one's health outcomes. Therefore they were more compliant with medication instructions. On the other hand, individuals who attributed their health status to internal factors were more noncompliant in medication taking. Ultimately [41] consider that low levels of both self-efficacy and internal locus of control are considered barriers to antihypertensive management. Self-efficacy influences the initiation and maintenance of health behaviors.36 In addition, patients with higher self-efficacy scores were found to have better adherence than those with low self-efficacy. It also has demonstrated that low self-efficacy affects the development of an internal health locus of control. They added that lack of social support, particularly from friends and family is also considered a barrier to adherence and self-care while high levels of support are related to better adhere to the therapeutic regimen. The patient-provider relationship, satisfaction with communication, information about therapeutic regimen also affect adherence.

7. Conclusion

The study asserted that around three-fifths of preeclamptic women endorse more external powerful others health locus of control in contrast, around one-third, hold internal HLC while the minority adopt external chance HLC. In addition, women who hold external powerful others health locus of control had a significantly higher total knowledge and satisfactory adherence to the antihypertensive regimen than those who captivate internally and chance health locus of control.

8. Recommendation

1. A police established by the governmental health authorities mainly, the hospital and the obstetric staff to have the commitment for promoting the health of preeclamptic woman using appropriate knowledge to address preeclamptic woman' beliefs, intentions, and self-efficacy (perceived ability to perform the action).) to improve adherence to the antihypertensive regimen, involving complex behavior changes.

2. Simplify therapeutic regimen with well-standardized practices and providing written instructions for new regimen prescriptions.

3. Health care providers help their patients to be more active, brainstorm options and consider the advantages and disadvantages of various therapeutic approaches. Collaboration and negotiation are integral to these encounters, in order to help pregnant women assume control over decision making.

4. Health care providers should cultivate women - centered relationships that respect patient autonomy, discuss collaboratively with women about treatment rationales and goals; problem-solving approach, make a reasoned decision and evaluate the success of that choice. Use self-monitoring, social supports, and reinforcement, to achieve the desired outcome.

5. Health care worker should devote attention and resources to empowering women to take informed choices decision regarding their health providing positive feedback to patients for their small successes, as any feeling of success may make them feel that they are in control of their illness .

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