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Knowledge and Practices of High Risk Pregnant Women regarding Ocular Changes and Eye Care during Pregnancy

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1.ABSTRACT

Background: Eye is used for almost all activity that performed, that is why vision is sense that is valued for human beings in general and specifically for pregnant women. Pregnancy-related ocular changes can lead to several potential consequences throughout the life course of pregnant women. The current study **aimed** to assess knowledge and practices of high risk pregnant women regarding ocular changes and eye care during pregnancy. **Design:** A descriptive cross sectional study design was used to accomplish the aim of the current study in High-risk unit at Mansoura University Hospital and outpatient antenatal clinics of New Obstetrics and Gynecology Hospital in Mansoura city. A convenient sample of 150 pregnant women who were diagnosed as high-risk related pregnancy conditions. One tool was used for data collection to assess participants' health profile and structured interviewing questionnaire schedule to assess women' knowledge level about pregnancy-related physiological and pathological ocular changes and pregnant women' eye health care practices during pregnancy. **Results** of this study shows that nearly the half (49.3 %) of the studied women didn't know that pregnancy changes the physiology of the eye, 39.3% of them didn't know that preeclampsia disturbs vision,46.7% of them didn't know that eye surgery can manage cataract sight loss, the majority (88.7%) of them didn't realize that diabetic retinopathy is a common complication for diabetes mellitus and 85.3%of them couldn't define glaucoma correctly as a damage of the optic nerve due to high intraocular pressure as well as 74% of them had unsatisfactory level of eye heath care practices during pregnancy. This study **concluded** that high risk pregnant women had poor knowledge about pregnancy-related ocular changes and unsatisfactory level of eye heath care practices. Thus, it is **recommended** to develop health educational guideline to improve high-risk pregnant women' awareness about pregnancy-related ocular changes and eye heath care practices during pregnancy.

Keywords: *Eye care, high-risk pregnant women, knowledge, practices.*

2.Introduction:

Human eye is the organ that gives the sense of sight, allowing to observe and learn more about surrounding world more than other four senses. Eye is used for almost all activity that performed, that is why vision is sense that is valued for human beings in general and specifically for pregnant women **(Hutmacher,2019)**. Pregnancy is a physiological situation that place abnormal stress and demands on body systems. During pregnancy, each body organ behaves at variation than in non-pregnant state including metabolic, hemodynamic, vascular and immunologic changes that occur throughout pregnancy **(Anton et al., 2021)**.

Ocular changes during pregnancy are one of these changes and are divided into physiological and pathological changes. Most of these physiological changes are benign including chloasma, ptosis, an increase in corneal curvature, changes in corneal thickness, refractive errors and a decrease in intraocular pressure. On the other hand, some of serious pathology may develop over the course of pregnancy and requires prompt diagnosis and management, the pathological eye conditions can be classified into preexisting pathologies as diabetic retinopathy or glaucoma and emerging ocular diseases as eclampsia **(Naderan & Jahanrad, 2017)**.

Regardless of the different mechanisms by which these ocular changes occur, the key point is the establishment of an effective perinatal screening program to monitor the new development or successive progression of these ocular abnormalities. Irrespective of the

visual health status of the pregnant women, regular perinatal eye examination should be scheduled in order to assure continuous surveillance of healthy eyes **(Qin, Chen, &Cugati, 2020)**.

Nurses provide the key components of effective nursing interventions to address the needs related to eye disorders and vision impairment across the life course. These interventions involve promotion, prevention, treatment and rehabilitation. The nurse can raise high-risk pregnant women' awareness about pregnancy- related ocular changes and eye health care practices during pregnancy to reduce both maternal and fetal risks as well as improving health outcomes leading to positive improvement in quality of their life **(Wong et al., 2020)**.

2.1Significance of the study

During pregnancy, metabolic and hormonal changes can upset the normal visual functions of the women' eyes. Visual disturbances are a chief complaint of most women during pregnancy. This problem is due to either physiological changes or exacerbations of pre-existing medical conditions. Most ocular changes occurred in pregnancy are temporary but occasionally lead to permanent complications that may affect the health of the women **(Diress, et al.,2021)**.

An Iranian study revealed that, 89.2% of pregnant women with visual problem had worsen in the third trimester of gestation. Likewise, a study in Nigeria showed that physiological ocular changes such as refractive error is the common problem during pregnancy. Also, a recent study in Ethiopia, 35.66% of pregnant women had a refractive error, which can be one cause of vision impairment **(Nkiru, et al.,2018)**.

Pregnancy-related ocular changes can lead to several potential consequences throughout the life course of pregnant women. If not treated early, it will increase the risk of blindness and decrease the general well-being of pregnant women. It can also reduce productivity, increase the risk of depression and social loneliness lead to an inability to perform tasks alone and increase the risk of fall-associated injuries **(WHO,2019)**. Even though pregnancy-related ocular changes have lots of serious consequences across the life course of pregnant women, few studies are conducted in Egypt on this topic. Thus, this study aimed to assess knowledge of high-risk pregnant women about pregnancy-related ocular changes and their eye heath care practices during pregnancy.

2.2Aim of the study

The aim of this study is to assess knowledge and practices of high risk pregnant women regarding ocular changes and eye care during pregnancy.

2.3Research Questions

1. Do high-risk pregnant women have knowledge related to physiological and pathological ocular changes during pregnancy?
2. What are eye care practices do high-risk pregnant women follow during pregnancy?

3.Subjects and method

3.1Research design:

A descriptive cross-sectional design was used to accomplish the aim of the current study. This design allows the researcher to describe the study variables (knowledge about pregnancy-related ocular changes and eye health care practices) as it is without manipulating them at specific point of time for defined population (high-risk pregnant women).

3.2Setting study:

This study was conducted at high-risk pregnancy unit at Mansoura University Hospital and outpatient antenatal clinics of New Obstetrics and Gynecology Hospital in Mansoura city, Daqahliya governorate, Egypt.

3.3Sample Size:

Sample size was calculated through Clincalc.com sample size calculator software, at 5% error (95.0% significance) and 20.0 error (80.0% power of the study), assuming percentage of suffered knowledge about surgical treatment of cataract is (72.9%) **(Bangladish study, 2016)** and it is expected to increase in our community from 10.0. The

calculated sample size is 141 and we can add 6.0% for better quality of collected data. So, the field sample will be 150 pregnant women.

3.4Subjects of the study:

The study utilized a convenient sample of 150 pregnant women who admitted at high-risk unit or attended outpatient antenatal clinics of New Obstetrics and Gynecology Hospital, accepted to participate in the study and were diagnosed as high-risk related pregnancy condition e.g., pre-eclampsia, eclampsia and diabetes mellitus.

3.5Tools of Data Collection:

Structured interviewing questionnaire consists of four parts for data collection was developed by the researcher after reviewing relevant literatures as follow;

Part(1): Socio-demographic characteristics of the studied women as age, educational level, job, residence, …. etc.

Part (2): Studied women' histories as medical, surgical, obstetric histories and pregnancy- related high-risk conditions as well as presence of eye health problems.

Part (3): Studied women' knowledge about pregnancy- related physiological ocular changes (eye dryness, changes of intraocular pressure and corneal thickness), women' knowledge about pregnancy- related pathological ocular changes and common eyes diseases such as cataract, diabetic retinopathy and glaucoma **(Biswas, 2016; Naderan, 2018)**.

Scoring system: knowledge tool was19 items questionnaire. The studied women' response for each item with either; "correct answers" which given score (1) or don't know answers which considered "incorrect answers" and were given score (0). The total score, was categorized as:

- Poor: if the score was < 50 % from the maximum score.
- Fair: if the score was 50 % to 75 % from the maximum score.
- Good: if the score was > 75 % from the maximum score.

Part (4): Studied women' eye health care practices. This part was adapted from **Karmoker (2016)**; **Khandekar, et al. (2010)**. The necessary modifications were done by the researcher. This part assessed pregnant women' eye health care practices during pregnancy such as hand washing, wearing sunglasses, eating a balanced diet, maintaining periodic eye check and timely treatment of eye problems.

Scoring system: each statement was given score (1) for done correctly or given score (0) for not done. It consists of 17 items. The scores for each area of practice were summed-up to give the total score. After that, the total score was divided by the number of area's items and then converted to be a percent score. The total score was categorized as the follow;

- Un satisfactory level: if the score was<70.0% from the maximum score.
- Satisfactory level: if the score was≥ 70.0% from the maximum score.

3.6Validity of tools:

Before conducting the current study, content validity of the study tools was checked by three experts (Assist. Prof. Samia Ibrahim Osman, Assist. Prof. Eman Fadel & Dr. Marwa Ibrahim Hamdy) in the field of Woman's Health and Midwifery Nursing and Ophthalmology to test the validity of its content. Based on expertise's suggestions, paraphrasing of some questions were done to be clear for the studied women, the final form of questionnaire was used for data collection.

3.7Reliability of tools:

The tool of data collection was tested for its reliability using Cronbach's alpha test in statistical package for Social Science (SPSS) version 22 and it was considered relatively homogeneous item as indicating by the high reliability, where its internal consistency was (alpha 0.05 and beta 0.2).

3.8Field work:

The research process was carried out through two phases; preparatory and operating phases as follow;

Preparatory Phase:

This phase included reviewing the national and international relevant literature and theoretical knowledge about the various

aspect of the study using articles, books, journals to develop data collection tool which developed by the researcher. First, the questionnaire was prepared in English, translated into Arabic language and reviewed by bilingual Arabic expertise. Then, the tool was validated as previously mentioned.

3.9Pilot study: Pilot study was conducted prior to data collection on 10% of the pregnant women (15pregnant women) to evaluate the clarity and applicability of the tool as well as to confirm that the questions were suitable, easily understood, covered the aim of the study and carried the same meaning that designed for it. Participants of the pilot study were not included in to the sample size. According to the data analysis of pilot results, modifications were done as paraphrasing of some questions to be clear for the studied women.

Operating phase:

Official permissions to carry out the study were obtained from the Dean of Faculty Nursing, the Head of Obstetrics & Gynecology Department and the Head of outpatient antenatal clinics of New Obstetrics and Gynecology Hospital. The researcher alternatively attended to one of the study settings three days /week from 9A.M. to 2 P.M. until the sample size was met. At the beginning of the interview, the researcher introduced herself to each pregnant woman and provided full explanation about the aim of the study to gain her acceptance and cooperation as well as her formal written consent. After that, the study tool was discussed and completed by the researcher through face-to-face interview in a private room (away from the examination room), through the interview, the researcher provided health education that help pregnant woman to change their behaviors, such as healthy lifestyle, when to seek medical help to maintain healthy eyes during pregnancy and healthy eye care practices. At the end of the interview, the researcher thanked participants for their cooperation through the interview.

3.10Ethical consideration:

An ethical approval was obtained from the Ethical Committee, Faculty of Nursing-Mansoura University, then an official letter from Faculty of Nursing, Mansoura University was directed to the head of outpatient antenatal clinics of New Obstetrics and Gynecology Hospital and head of Obstetric Department at Mansoura University Hospitals to obtain the official permission to conduct the study after explaining its aim. Prior to the study, a written formal consent was obtained from each woman after explaining the nature, purpose and benefits of the study. Women were informed that participation in the study was voluntary and that they had the right to withdraw from the study at any time. Privacy, safety and confidentiality were absolutely assured throughout the whole study and the result will be used as a component of the necessary research for Master study as well as for publication and education.

3.11Statistical analysis

Collected data were coded, computed and statistically analyzed using SPSS (statistical package of social sciences), version 22. Data were presented as frequency and percentages (qualitative variables) and mean ± SD (quantitative continuous variables). Chi square (χ^2) was used for comparison of categorical variables, and was replaced by Fisher exact test (FET) or Mont Carlo Exact Probability (MEP) test if the expected value of any cell was less than 5. Pearson's correlation was used to calculate correlation coefficient between two quantitative variables. The difference was considered significant at $P \leq 0.05$and highly statistically significant at p value < 0.001.

3.12Limitations of the study:

The current research work had one limitation as presence of limited recent research studies that were conducted globally on knowledge and practice of high risk pregnant women regarding ocular changes and eye care during pregnancy which led to presence of old studies in the current study discussion.

4.Results

Table1. shows the general characteristics of the studied women; data revealed that, maternal age ranged from 18-49

years with mean 29.99 ± 6.69 years. More than the half (62%) of the women were multigravida with mean gravidity 3.41± 1.90 while 46% of them were pregnant at their 36 months with mean gestational age 32.29 ± 5.10.

Table2. shows women' knowledge level about pregnancy-related physiological ocular changes; data revealed that, nearly the half (49.3 %) of the studied women didn't know that pregnancy changes the physiology of the eye.

Table3. shows women' knowledge level regarding the effect of hypertensive disorders on vision during pregnancy; data revealed that, 39.3% of the studied women didn't know that preeclampsia disturbs vision.

Table 4. presents women' knowledge level about cataract of the eye; data revealed that, about 37.33 % of the women didn't know definition of cataract and 46.7% of them didn't know that eye surgery can manage cataract sight loss.

Table 5. shows women' knowledge level about diabetic retinopathy; data revealed that, the majority (88.7%) of the studied women didn't realize that diabetic retinopathy is a common complication for Diabetes Mellitus (DM) that may lead to blindness. Regarding to the women ' knowledge about the effect of pregnancy on pre-existing diabetic retinopathy, more than the half (56.7%) of the women didn't know that pregnancy worsen the short-term risk of pre-existing diabetic retinopathy effects.

Table 6. demonstrates women ' knowledge level about glaucoma of the eye; data revealed that, majority (85.3%) of the studied women couldn't define glaucoma correctly as a damage of the optic nerve due to high intraocular pressure.

Figure 1. i1llustrates that 71.3 % of the studied women had poor knowledge about pregnancy-related ocular changes while, 23.3 % of them had fair knowledge and only 5.3% of them had good knowledge.

Table 7. presents eye health care practices of the studied women; data revealed that, nearly an equal proportion (78%, 78.7%, 70%) of the studied women didn't wear sunglasses, didn't have periodic eye checkup and didn't exercise, respectively. Likewise, about 42,7% ,40%, 57.3% allow others to share their towels, didn't sleep enough time to rest their eyes and didn't comply to their medical eye prescriptions, respectively.

Figure 2. shows that nearly three quarters (74%) of the studied women had unsatisfactory level of eye health care practices while 26% of them had satisfactory practices.

Figure 3 shows that there was significant, positive and mild correlation between women' total knowledge and their total practice scores which mean that the more knowledge of the women, the better healthy eye practices.

Table (1): Frequency and percent distribution of the studied women according to their general characteristics.

Variables	No=150	%
Age (years)		
18 – 25	47	31.3
26 – 33	59	39.3
34 – 41	37	24.7
42 – 49	7	4.7
Mean ± SD= 29.99 ± 6.69 years		
Educational level		
Can't read & write	29	19.3
Basic education	87	58
University	34	22.7
Working status		
House wife	123	82.0
Employee	27	18.0
Residence		
Rural	117	78.0
Urban	33	22.0

Gestational age		
≤ 20 weeks	3	2.0
21-	10	6.7
26 –	38	25.3
31 –	30	20.0
36 +	69	46.0
Mean= 32.29± 5.10		
Gravidity		
3+	93	62.0
1-2	57	38.0
Mean= 3.41± 1.90		
Parity		
3+	51	34.0
1-2	69	46.0
None	30	20.0
Mean= 1.93± 1.54		

Table (2): The women' level of knowledge about pregnancy-related physiological ocular changes.

Variables	No	%
Pregnancy can affect the eye physiologically		
Yes	35	23.3
No	91	60.7
Don't know	24	16.0
Ocular changes of the eye *		
Eye dryness	66	44.0
Decrease intraocular pressure	1	0.7
Increase melasma in eyelids	4	2.6
Changes in corneal thickness	21	14.0
Don't know	74	49.3
Pregnancy affects vision acuity		
Yes	58	38.7
No	13	8.7
Don't know	79	52.7
Effect of pregnancy on tear production		
Increase tear production	33	22
Decrease tear production	41	27.3
Doesn't affect tear production	64	42.7
Don't know	12	8

Table (3): The women' level of knowledge regarding the effect of hypertensive disorders on vision

Variables	No	%
Preeclampsia leads to vision disturbance		
Yes	84	56.0
No	7	4.7
Don't know	59	39.3
The effect of preeclampsia on the eye*		
Poor vision	87	58.0
Seeing colors indistinctly	15	10.0
Increase sensitivity to light	14	9.4
Temporary loss of sight	32	21.3
Don't know	44	29.3

Table (4): The women' level of knowledge about cataract of the eye

Variables	No	%
Definition of cataract		
Presence of white spots on the eye	18	12.0
Lens opaque	50	33.33
Growing of white membrane over the eye	12	8.0
A normal age-related process	14	9.33
Don't know	56	37.33
Treatment of cataract		
Surgery and intraocular lens implantation	94	35.3
Medication	3	2.0
Don't know	53	62.7
Sight loss can be managed with surgery		
Yes	60	40.0
No	20	13.3
Don't know	70	46.7

Table (5): The women' level of knowledge about diabetic retinopathy

Variables	No	%
Diabetic retinopathy is a common complication of Diabetes Mellitus (DM)		
Yes		
No	14	9.3
Don't know	3	2.0
	133	88.7
Risk factor/s that worsen diabetic retinopathy*		
Diabetes	40	26.6
Hypertension	25	16.6
Pregnancy	30	20
Don't know	100	66.6
Pregnancy affects pre-existing diabetic retinopathy		
Increase diabetic retinopathy	50	33.3
Decrease diabetic retinopathy	3	2.0
Doesn't affect diabetic retinopathy	12	8.0
Don't know	85	56.7
Routine eye examination during pregnancy should be done		
Monthly	2	1.4
Every 2 months	6	4.0
Every 3 months	61	40.6
Don't know	81	54.0
Diabetic retinopathy can be treated during pregnancy by		
Medication	2	1.3
Surgery	3	2.0
Laser	13	8.7
Don't know	132	88.0

Table (6): The women ' level of knowledge about glaucoma of the eye

Knowledge	No	%
Definition of glaucoma		
Damage of optic nerve due to hypertension	6	4.0
Damage of optic nerve due to high intraocular pressure	10	6.7
An age-related process that weakens vision	6	4.0
Don't know	128	85.3

Early detection and management reduce risk of blindness		
Yes		
No	99	66.0
Don't know	4	2.7
	47	31.3
Glaucoma blindness can be treated with		
Surgery	16	10.7
Medication	9	6.0
Surgery & Medication	24	16.0
Don't know	101	67.3
Sight loss can be treated		
Yes	17	11.3
No	8	5.3
Don't know	125	83.3
Pregnancy improves glaucoma		
Yes	5	3.3
No	10	6.7
Don't know	135	90.0

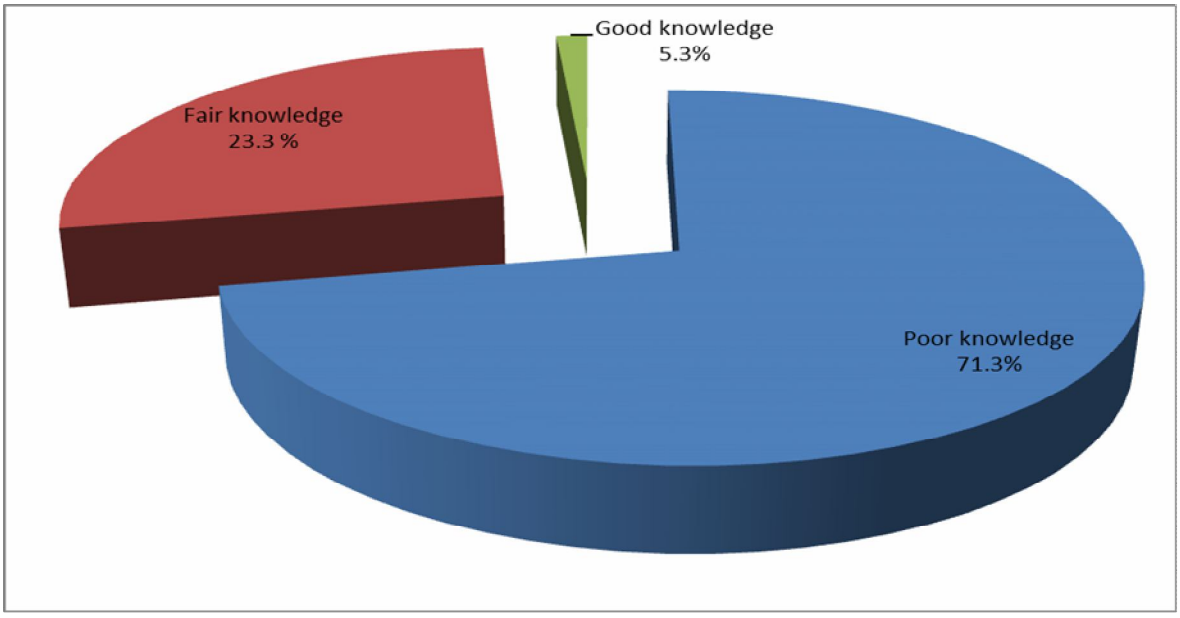

Figure (1): Women' level of knowledge about pregnancy-related ocular changes

Table (7): Frequency and percent distribution of the studied women according to their eye health care practices

Practices	Not Done		Done	
	No=150	%	No=150	%
Wearing sunglasses when outdoors	117	78.0	33	22.0
Avoid sharing towels and napkins with other people	64	42.7	86	57.3
Washing hands before and after touching eyes	52	34.7	98	65.3
Washing hands after working on crops and pesticides	8	5.3	142	94.7
Resting eyes every 20 minutes when looking at the computer screen	91	60.7	59	39.3
leaving a distance (two meters) while watching TV	36	24.0	114	76.0
Avoid sitting in smoked or dusted areas	70	46.7	80	53.3
Washing eyes with warm water for 15 minutes when suspecting entrance of chemicals into the eye	62	41.3	88	58.7
Compliance to medical eye prescriptions	86	57.3	64	42.7
Having periodic eye checkup	118	78.7	32	21.3
Eating a balanced diet rich in vitamin A, including yellow, red fruits, green vegetables, dairy products, liver, kidneys and fish oil	76	50.7	74	49.3
Maintaining low sugary diet	47	31.3	103	68.7
Maintaining low sodium diet	91	60.7	59	39.3
Keeping normal level of cholesterol in the blood	43	28.7	107	71.3
Avoid smoking and alcohol	24	16.0	126	84.0
Doing exercise to improve blood circulation as walking	105	70.0	45	30.0
Sleeping 8 hours /day	60	40.0	90	60.0

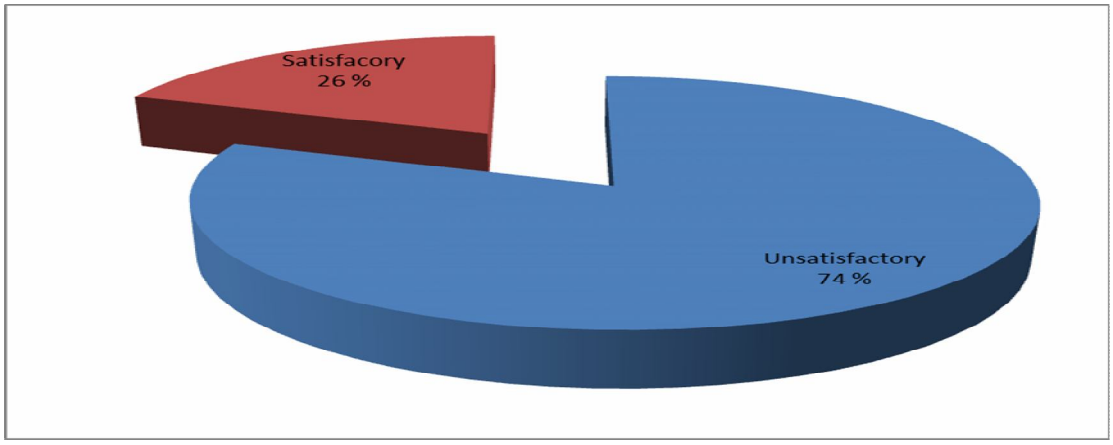

Figure (2): Eye Health Care Practices' Level among the Studied Women

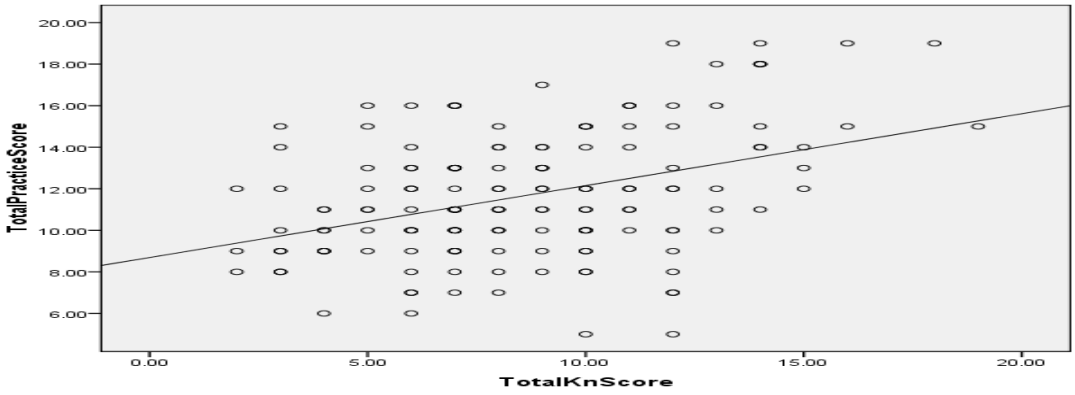

Figure (3): Correlation between Women' Knowledge Level about Pregnancy-related Ocular Changes and their Eye Heath Care Practices during Pregnancy

5. Discussion

This study was conducted to assess knowledge and practice of high-risk pregnant women regarding ocular changes and eye care during pregnancy. The findings of the present study answered the research questions related to women' knowledge about pregnancy-related physiological and pathological ocular changes and their eye health care practices during pregnancy; the study findings revealed that majority of the studied women had inadequate knowledge about pregnancy-related ocular changes and had unsatisfactory level of eye health care practices during pregnancy.

The current study findings showed that, nearly the half of the studied women didn't know that pregnancy changes the physiology of the eye causing decrease in the intraocular pressure, eye dryness, increase melasma in eyelids and changes in corneal thickness. From the researcher's point of view, women' knowledge about ocular changes that occur during pregnancy tends to be limited because health education programs for the society regarding eye changes that occur during pregnancy are limited, thus reflect the need to develop guidelines to approach ocular changes during pregnancy.

The finding of current study revealed that, more than one third of the studied women didn't know that preeclampsia disturbs vision. This result was supported by **Li et al. (2020)** stated that adults with visual impairment in the study region knew less about sight loss caused by hypertension and only one fifth of subjects knew that hypertension can cause vision loss. From the researcher's point of view, the deficits of knowledge about hypertensive retinopathy because this disease can be asymptomatic and progress with aging, thus, it may not be easily identified by the public. Accordingly, there is a need to develop guideline awareness program about the effect of hypertensive disorders on vision during pregnancy for prompt intervention as close observations, early diagnosis and management that are essential to reduce both maternal and fetal risks.

The present study finding showed that more than two thirds of the studied women didn't define cataract correctly as lens opaque. This result may be explained as the majority of women had low educational level which positively correlated to poor knowledge level .This agreed with **Karmoker (2016)** assess awareness and knowledge regarding eye diseases and found that one quarter of subjects answered cataract as lens opaque.

Data also revealed that, more than the half of the studied women didn't know that surgery and intraocular lens implantation as the treatment for cataract. On the other hand, **Lin-Li et al. (2020)** and **Karmoker (2016)** their subjects knew that cataract can be treated by surgery. Again, **Alimaw, Hussen, Tefera, and Yibekal (2019)** stated that eighty percent of the subjects conceived that cataract is a treatable condition and cited surgery as the best treatment option. From the researcher's point of view, the difference between studies may be related to that their respondents had high educational level which positively correlated to their knowledge about cataract. Furthermore, their subjects had past familial history with cataract, means they had more experience, knowledge about cataract and its treatment.

Regarding to the women' knowledge about sight loss resulting from cataract, data revealed that, nearly the half of the studied women didn't know that eye surgery can manage loss of sight resulted from cataract. This was in agreement with the study of **Karmoker (2016)** stated that their subjects answered that it is not possible to get vision back after surgery.

As regards the studied women' knowledge about diabetic retinopathy, the present study showed that, the majority of the studied women didn't realize that diabetic retinopathy is a common complication for diabetes mellitus and may lead to blindness. This result could be explained as in Egypt, the emphasis of health care is mostly clinical with little attention paid to health education, promotion and prevention of diseases. Another explanation is that literacy and being in the low

or middle socio-economic class have been noted to influence the knowledge of diseases.

This finding matched with **Jassim, Dawood, and Hussein (2021)** reported that more than the half of the sample had a poor level of knowledge regarding diabetic retinopathy. On the contrary, **Achigbu, Oputa, Achigbu, and Ahuche (2016); Alsaidan and Ghoraba (2019); Li et al. (2020)** revealed that their subjects had high level of awareness about diabetic retinopathy. The difference between studies could be related to high literacy rates and proactive counseling in this country compared to the illiterate patients with diabetes in Egypt.

The findings of the present study found that more than the half of the studied women didn't know the frequency of routine eye checkup for diabetic women during pregnancy(once every 3 months).This result was supported with study by **Kumar et al. (2020)** found that, diabetic patients' awareness of regular diabetic retinopathy screening still was not enough and most of diabetic patients were not aware of the importance or the frequency of eye checkup. From the researcher's point of view, this result indicated the silent progression of this disease and reflected the lack of diabetic patients' awareness about importance of regular diabetic retinopathy screening as most of them never undergone for an eye exam until they developed a visual disorder.

Regarding to the women ' knowledge about the effect of pregnancy on pre-existing diabetic retinopathy, the present study showed that, nearly two thirds of women didn't know that pregnancy worsen the short-term risk of pre-existing diabetic retinopathy effects. From the researcher's point of view, this finding could be related to low educational level of subject that affect their level of knowledge so, they need to health education program about the effect of pregnancy on pre-existing diabetic retinopathy which stresses the importance of follow up as well as ocular examination before and during pregnancy.

Regarding the studied women ' knowledge about glaucoma, it was found that, the majority of the studied women didn't define glaucoma correctly. Similar study by, **De-Gaulle and Dako-Gyeke (2016)** reported that the findings of their study display inadequate knowledge about glaucoma, thus, reflects the need to effectively inform and educate pregnant women about this disease. On the contrary, **Biswas (2016)** found that less than the half of the sample correctly define glaucoma and reported that the majority of the subjects identified their eye problem as glaucoma as well as they knew that glaucoma caused a progressive and irreversible vision loss. From the researcher's point of view, educational level may explain the difference between studies as the majority of the current study subjects had low education.

The current study also clarifies that, the majority of the studied women reported incorrect answer as sight loss resulted from glaucoma can be treated. These findings were similar with the study of **Biswas (2016)** found that poor percentage of their subjects knew that glaucoma blindness is permanent and can't be treated.

The current study findings showed that nearly three quarter of the studied women had poor knowledge about eye heath care practices during pregnancy. This was in the same line with **Al Rashed et al. (2017)** indicated that diabetic patients have poor knowledge about eye care practices. The available data suggest that there is a need for health education in those current subjects to increase their level of awareness and knowledge about proper eye care during pregnancy. Such awareness and knowledge could lead to better understanding and acceptance of routine eye checkup for early detection and treatment of eye diseases, thereby reducing visual impairment.

The present study revealed that three quarters of the studied women had unsatisfactory level in performing their self-care practices regarding eye care. The possible explanation for inadequate self-care practices level could be due to low educational level of subjects that leaded to having a deficient level of knowledge about eye care and consequently about proper self-care practices. Another explanation is that, many of healthcare providers weren't completely discussing self-

care practices with their patients because of work pressure and their belief that self-care practices were mostly the patients' responsibility.

The findings of the present study showed that there was significant, positive correlation between women' knowledge and their eye health care practices which mean that the more knowledge, the better practices. In congruence with this, an Iranian study by **Babazadeh et al. (2017)** emphasized on the importance of knowledge among diabetic patients in promoting their self-care practices and consequently achieving higher Quality of Life (QoL). Also, **Kugbey, Asante and Adulai (2017)** highlighted that, perception of illness played a vital role in engaging patients in their self-care practices that consequently leaded to higher QoL. This indicated when patients acquired higher knowledge about their diseases, they engaged more in their self-care practices which could improve health outcomes leading to positive improvement in their QoL.

The findings of current study showed that, the majority of the studied women had inadequate knowledge about pregnancy-related ocular changes and unsatisfactory level of eye heath care practices during pregnancy. For this reason, these necessities the importance of developing health educational program to improve high-risk pregnant women' awareness about pregnancy- related ocular changes and eye health care practices during pregnancy.

6..Conclusion

The current study findings concluded that; nearly three quarters (71.3 %) of the studied women had poor knowledge about pregnancy-related physiological and pathological ocular changes, nearly three quarters (74%) of the studied women had unsatisfactory level of eye heath care practices during pregnancy and there was significant and positive correlation between women ' total knowledge and their total practice scores means that, the more knowledge of the women, the better healthy eye practices due to high educational level of women leads to having an efficient level of knowledge about eye care and consequently proper self-care practices and improving quality of life.

7. Recommendations

In the light of current study findings, the following recommendations were suggested:

- Developing health educational program to improve awareness of high-risk pregnant women about importance of eye periodic checkup to monitor ocular abnormalities during pregnancy.
- Developing health educational program that discusses common eye diseases (cataract, glaucoma, diabetic retinopathy) which may be developed during pregnancy and its effect on the eye.

Further researches studies to

- Assess the barriers that hinder pregnant women to be aware about healthy hygienic practices for eye care during pregnancy.
- This study should be replicated in other sitting to generalize its results.

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9.Conflict of interest

The authors observe that there is no dispute with respect to this research.

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