Impact of Educational Guidelines on Improving Knowledge, Lifestyle and Quality of Life for Pregnant Women with Gastroesophageal Reflux Disease

Amany Hassan Abd Elrahim[1], Magda Fawzy HasabAllah[2], Zeinab Mohammed Hassan[3] & Safaa Ali Abdelnaem[4]

[1.] Lecturer of Woman Health and Obstetrics Nursing, Faculty of Nursing -Minia University, Egypt.

[2.] Lecturer of Woman Health and Obstetrics Nursing, Faculty of Nursing -Minia University, Egypt.

[3.] Lecturer of Community Health Nursing, Faculty of Nursing – Minia University, Egypt.

[4.] Lecturer of Woman Health and Obstetrics Nursing, Faculty of Nursing -Minia University, Egypt.

Abstract:

Gastroesophageal reflux disease (GERD) is reported in up to 80% of pregnancies. **Aim of the study:** To evaluate the impact of educational guidelines on improving knowledge, lifestyle and quality of life for pregnant women with GERD. **Methods:** A Quasi-experimental research design was used to achieve the aim of the study. **Setting:** The research was carried out at out-patient antenatal clinics in Minia University Hospital for Obstetrics and Pediatrics (MUHOP). **Sampling:** A purposive sample of 80 pregnant women with GERD was recruited. **Tools:** Four tools were utilized for data collection, **Tool (1):** socio-demographic data, obstetric history and history of GERD, **Tool (2)** knowledge assessment tool about GERD, **Tool (3)** lifestyle assessment tool regarding GERD, and **Tool (4)** Gastroesophageal reflux disease health-related quality of life assessment tool (GERD-HRQL). **Results:** The current study revealed that 72.5 % of the studied women had poor knowledge about GERD in pretest which decreased to 6.3% in posttest. Additionally, it revealed that 76.3 % of studied women had unhealthy lifestyle regarding GERD in pretest reduced to 8.8 % in posttest. Furthermore, it revealed that 72.5 % of studied women had poor QOL toward GERD in pretest diminished to 18.8 % of in posttest. Also, there were a positive correlation between studied women's knowledge, Lifestyle and QOL in pretest and posttest with statistically significant differences. **Conclusion:** Application of educational guidelines have a good impact on improving knowledge, lifestyle and quality of life of pregnant women suffer from GERD. **Recommendations:** Provision of in-service educational program and ongoing supervision in rural regions to increase pregnant women's awareness of GERD and the importance of lifestyle adjustments.

Keywords: Educational Guidelines, Gastroesophageal Reflux Disease (GERD), Knowledge, Lifestyle, & Quality of Life (QOL).

Introduction

Gastro-esophageal reflux disease (GERD) is the most common acid-related condition today, affecting people of all ages from infants to adults. GERD symptoms are prevalent in pregnant women, and pregnancy has long been recognized as a condition that predisposes to GERD **(Qadrie et al., 2018).** The World Gastroenterology Organization defines GERD as "troubling symptoms that impair an individual's quality of life, or injury or problems caused by the retrograde movement of stomach contents into the esophagus, oropharynx, and/or respiratory tract" (**Cheng & Ouwehand, 2020).**

Pregnancy has been linked to a higher incidence of GERD symptoms, with prevalence estimates ranging from 30 to 80 percent **(Jemilohun et al., 2016).** The presentation of typical GERD symptoms during pregnancy is similar to those of the general adult population. The most common symptoms are heartburn and regurgitation. The majority of pregnant GERD sufferers say that their symptoms worsen after eating and before bed. GERD symptoms have a significant influence on pregnant women's quality of life, and medication for symptom relief in late pregnancy is insufficient. The occurrence of heartburn during pregnancy increases the risk of GERD **(Pisegna et al., 2017).**

Pregnant women suffering from GERD in the second or third trimester have a significantly reduced quality of life (QoL). In pregnant women with GERD, symptoms such as sleep disturbances, diminished vitality, impaired physical functioning, and mental discomfort might be noticed **(Lee et al., 2021).** Health Related Quality of Life (HRQL) relates to a person's ability to carry out everyday tasks (functioning), as well as their outlook on life (well-being) and subjective management of their health status **(Alshammari et al., 2020).**

Several variables have been associated with the etiology of GERD during pregnancy, including decreased lower esophageal sphincter pressure, increased intra-abdominal pressure due to the enlarged gravid uterus, and changes in gastrointestinal transit (**Jemilohun et al., 2016**)

The clinical history is crucial in determining the cause of esophageal symptoms. Weight increase or loss, gastrointestinal bleeding, eating habits, smoking, and alcohol usage were all important details (**Ahmed & Hassan 2021**).

The diagnosis of GERD can be made efficiently based just on symptoms. A thorough anamnesis should be performed, with a focus on current symptoms as well as any previous dyspeptic or reflux-related disorders. Invasive tests such as pH probes and manometry may be required in rare cases, despite the fact that there is no contraindication to their use during pregnancy. Because the fetus is exposed to radiation, barium X-ray examination should be avoided. Upper gastrointestinal endoscopy may be recommended if symptoms or consequences such as dysphagia, hemorrhage, anemia, or weight loss persist (**VĂRȘA et al., 2021**)

Management for GERD in pregnant women is similar to treatment for GERD in other people. Conservative treatments such as lifestyle changes and avoiding dietary triggers that may increase symptoms are the first-line therapy for GERD in pregnancy (**MacFarlane, 2018**). Eating smaller meals, elevating the head of the bed, not eating late at night, resting on the left side, reducing fluid intake with meals, and increasing physical exercises are the primary lifestyle adjustments. Avoiding alcohol, cigarettes, and medicines that reduce lower esophageal sphincter (LES) pressure, as well as specific foods like chocolate, mints, fatty and spicy foods, and certain beverages (coffee, citrus juices, tomatoes, and carbonated goods), might assist in relieving symptoms and is strongly recommended. If the women follow this advice, mild to moderate symptoms can usually be addressed (**VĂRȘA et al., 2021** & **Body, & Christie, 2016**).

Several patients have been demonstrated to benefit from nursing educational programs regarding many diseases. So it's critical to determine how much patients already know about GERD before properly educating them. Lifestyle, eating habits, exercise, psychology, and acupuncture interventions all work together to improve pharmacological therapy, therapeutic benefits, adherence, and symptom relief (**Haruma et al., 2020**).

Significance of the study:

The prevalence rate of GERD symptoms in pregnancy has been estimated to be between 30

and 80 percent in research conducted in Western countries. Pregnancy has long been thought to be a risk factor for GERD. The occurrence of GERD during pregnancy has been linked to a number of different pathogenic pathways. Lower esophageal sphincter (LES) pressure is known to be reduced by increased intra-abdominal pressure and sex hormones during pregnancy. Multiparity, gestational age, GERD history, and GERD in the family are all known risk factors for GERD (**Lee et al., 2021**).

Gastroesophageal reflux disease can affect one's health-related quality of life by causing psychological co-morbidities, poor sleep quality, and time away from work, all of which can have a significant financial impact (**Alsaleem et al., 2021**). Although GERD symptoms are recognized to affect one's quality of life, there is a paucity of research among pregnant women (**Malfertheiner et al., 2017**).

There is a lack of research available in Egypt that reports on knowledge, lifestyle, and quality of life for pregnant women with GERD, but most studies (**Ayoub & Awed, 2018; Ibrahim & Ali 2020; Mohamed et al., 2021**) have focused on assessing minor discomforts during pregnancy. As a result, this is the first study to focus on improving knowledge and quality of life for pregnant women with GERD, as well as the importance of lifestyle modification to improve outcomes and reduce the incidence of potential complications.

Aim of the study:

This study aimed to evaluate the impact of educational guidelines on improving knowledge, lifestyle and quality of life for pregnant women with Gastroesophageal Reflux Disease.

Research Hypothesis

- Educational guidelines will improve the knowledge, lifestyle, and quality of life of pregnant women suffering from GERD.
- There is a significant association between knowledge, lifestyle, and quality of life with selected sociodemographic data.

Patients and Methods

Research design: Quasi-experimental research design (pre and post-test) was utilized.

Setting: The present study was conducted at out-patient antenatal clinics in Minia University Hospital for Obstetrics and Pediatrics (MUHOP).

Sample type: non probability sampling technique (a purposive sample) was used (those attending outpatient clinics during the period of the study and who were suffering from GERD).

Inclusion Criteria: Pregnant women who have been diagnosed with GERD, their age from 18 to 45 years, pregnant at any trimester and willing to participate.

Exclusion Criteria: Pregnant women with infectious disease in the GIT, as well as pregnant women with peptic ulcers, gastric cancer, and severe digestive disorders.

Sample Size: By using the following formula:

$$n = \frac{\left[2\left(Z_{\frac{\alpha}{2}} + Z_{\beta}\right)^2 \times p\ (1-p)\right]}{(p_1 - p_2)^2}$$, Type of test = two-

sided, considering level of significance of 5%, study power of 80%, where n = sample size required, p = pooled proportion of event, $p_1 - p_2$ = difference in proportion of event, $Z_{\frac{\alpha}{2}}$: This depends on level of significance, for 5% this is 1.96, Z β: This depends on power, for 80% this is 0.84,

$$n = \frac{[2(1.96 + 0.84)^2 \times 0.3\ (1-0.3)]}{(0.2)^2} = 80.$$ Based on

the previously mentioned formula, 80 pregnant women with (GERD) were recruited.

Study Tools:

Four tools were used in the present study for data collection:

The First Tool (pretest): It is a structured interviewing sheet developed by the authors. It consisted of three parts.

Part (I): Socio-demographic data: it included (age, residence, educational level, occupation, economic status, and telephone number).

Part (II): Obstetrical history of women: it included (No of pregnancy, No of parity, Trimester, BMI (underweight, ≤18.5, normal, 18.6–24.9, overweight, 25.0–29.9, obese, 30.0–39.9 and morbidly obese, ≥40).

Part (III): The history of GERD: It included (family history of GERD, heartburn in previous pregnancies, how long the woman had been suffering from GERD, heartburn in present pregnancy, regurgitation in present pregnancy, pre-gestational heartburn, and medication taken for GERD).

The Second Tool: Women's knowledge about GERD: (pre/post):

It is a structured interviewing sheet established by the authors to evaluate women's awareness about GERD that contains nine MCQ related to (concept of GERD, causes, risk factors, types, signs and symptoms, complications, treatment and management, and the source of knowledge about GERD).

Scoring system: knowledge questions were assumed scores (2&1) which represent (correct and incorrect) respectively. The whole items of knowledge were 9 items given 18 scores. These scores were transformed into percentage scores. Whereas poor knowledge

scored <50% (<9 grade), and average knowledge scored 50-<75% (9-<14 grade), good knowledge was considered if the percent score was ≥ 75% (≥14 grade) (**Ahmed & Hassan 2021**).

The Third Tool: Women's self-reported lifestyle regarding GERD (pre/post): It is a self-reported lifestyle interviewing sheet developed by the authors to assess a healthy lifestyle in dealing with GERD. It included eighteen (18) questions related to nutrition (7 questions), drinks (2 questions), losing weight (1question)clothing (1question),sleeping(3 questions), medication and home remedies(4 questions).

Scoring system: the lifestyle assessment tool has a Likert-type scale of three points ranging from usually (3), sometimes (2), and rarely (1). The total items of lifestyle were 18 items given 54 scores. These scores were converted into a percent score. Whereas **Unhealthy lifestyle** while the total score gave < 60% (<32 grade) and **Healthy lifestyle** while the total score from ≥60 (≥32 grade) (**Ahmed & Hassan 2021**).

The Fourth Tool: Gastroesophageal reflux disease health-related quality of life (GERD-HRQL) (pre/post): for assessment of the GERD's impact on the patients' QoL, the gastroesophageal reflux disease health-related quality of life (GERD-HRQL) questionnaire developed by (**Velanovich, 2007**) was used. This questionnaire assesses the severity of the symptoms of GERD by focusing on its typical symptoms. It is self-explanatory and composed of sixteen (16) items that examine the frequency of heartburn, regurgitation, difficulty swallowing, bloating, and the burden of GERD medications in the past two weeks. **Scoring system**: Each item is scored from zero to five with a maximum rating of (80), with a higher rating indicating a poor QoL ≥60 (≥38 grade) where as good QoL< 60% (<38 grade) (**Alshammari et al., 2020**).

Content validity: The study tools were revised by five-panel experts from community health & obstetrics and gynecological department nursing professors for accuracy, relevance, inclusiveness, understanding, applicability, and simplicity.

Reliability: The test by Alpha Cronbach was conducted to evaluate the steadiness of the instruments' internal consistency. The knowledge sheet was (0.879). It was (.0945) for the assessment of lifestyle scale and (0.976) for QOL. Hence, the sheets were found to be highly reliable.

Pilot study: It was carried out on 10% of the overall sample examined (8 women). It was carried out to assess the applicability and clarity of the instruments, evaluate the feasibility of fieldwork, and identify any potential difficulties that the investigator could encounter and impede the collection of data. No modifications were done. In the basic sample, the trial sample was involved.

Ethical Concern:
All formal permits were obtained from convenient authorities to perform the study. The relevance and purpose of this study were discussed with the participants. Participants were told that their contribution was voluntary and their right to discontinue at any time, that data confidentiality was achieved, and that the data collected was only used for the purpose of the present study.

Procedure:
A written approval letter was officially obtained from the directors and the head of the department of Obstetrics and Gynecology at Minia University Hospital for Obstetrics and Pediatrics (MUHOP), describing the purpose of the current research. The researchers visited the hospital (antenatal outpatient clinic) for three days a week from 9:30 a.m. to 12:30 p.m. until the predetermined sample size was achieved between the beginning of September 2021 and the end of February 2022 (about a six-month period). The present research was performed through three phases: the assessment phase (pre-test), the implementation phase, and the evaluation phase (post-test).

Assessment phase (pre-test)
- The researchers first conducted an interview with pregnant women diagnosed with GERD at the antenatal outpatient clinic, and briefly explained the essence and intent of the study. The women have been told that their contribution and their right to discontinuation at any time are optional. Oral approval from all women was achieved.
- After achieving the women's agreement to participate in the present study, the researchers explained to each woman an overview and illustration of the evaluation tools issues. Therefore, the researchers gather data related to socio-demographic characteristics, obstetrics history, GERD history, and participant knowledge, lifestyle, and QoL regarding GERD. It took about 30–35 minutes for each woman to complete the question sheet. Around (2:5) women were organized daily by the researchers. At the end of the pretest, an agreement was made with each woman on a suitable date for the implementation of educational sessions, and ten women who corresponded on the same date wereassembled (8 groups of women were arranged).

Implementation phase (carrying out education program)
- In the implementation phase, two educational sessions related to (GERD) were provided to the group of women based on their agreement on a suitable date for them. Each session took about 35–40 minutes. At the beginning, the pregnant women were oriented with the educational sessions' contents. In the 1st session, the definition of GERD,

causes, risk factors, symptoms, complications, treatment and management, and home remedies were discussed. The 2nd session concerned with a discussion about lifestyle changes to alleviate the (GERD) symptoms and improve women's QoL. It included discussion on a woman's healthy dietary habits and nutritional behaviors, the number of meals and foods that could increase or decrease their symptoms, and teaching the mother self-care activities that should follow, such as losing weight, avoiding tight clothing, and elevating the head of bed.
- Health education was given to the women as lectures and group discussions by using instructional material (videos and PPT) on health education in a separate room in the hospital; it emphasized improving women's knowledge and lifestyle in coping with (GERD) to improve women's QoL. At the end of the symposium, feedback from the women about the topic was obtained to ensure the ultimate benefits for women were achieved.
- A brochure covering information about GERD was given to women at the end of the sessions to achieve its objectives. It included important information about (GERD) such as definition, reasons, risk factors, clinical picture, investigation, consequences, treatment, and management, as well as the role of a healthy lifestyle in dealing with (GERD) and reducing its complications. Also, the researchers contacted women through mobile phones for posttest

Evaluation phase (post-test):
The evaluation phase was conducted during her antenatal visit (after four weeks) from the implementation of educational guidelines to detect her commitment to educational intervention instructions (post-test). In this phase, the influence of the educational guidelines on improving knowledge, lifestyle and QoL for women was achieved through a pre- and post-test comparison that was carried out after four weeks of intervention to determine their (GERD) knowledge, lifestyle and QoL.

Satistical analysis
The gathered data was organized, categorized, and analyzed using the statistical package for social studies (SPSS) version 22. Data was presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and mean and standard deviations for quantitative variables. The statistical tests used were the paired t-test, chi-square test, and correlation r-test. Statistical significance difference was considered when p-value ≤ 0.05, and high significance when p-value ≤ 0.001 and no statistical significance difference was considered when p-value > 0.05.

Results:

Table (1): Distribution of the studied sample according to their socio demographic characteristics (N = 80)

Demographic characteristics	Studied sample (80)	
	No	**%**
Age		
18< 25	20	25.0
25 < 35	34	42.5
35-45	26	32.5
Mean ± SD	**31.99±7.14**	
Residence		
Urban	36	45.0
Rural	44	55.0
Level of Education		
Illiterate	8	10.0
Primary	11	13.7
Preparatory	22	27.5
Secondary	25	31.3
University	14	17.5
Occupation		
Housewife	38	47.5
Employed	42	52.5
Income		
Insufficient	23	28.7
Sufficient	40	50.0
Sufficient and save	17	21.3

Table (2): Distribution of the studied sample regarding their obstetrical history (n= 80)

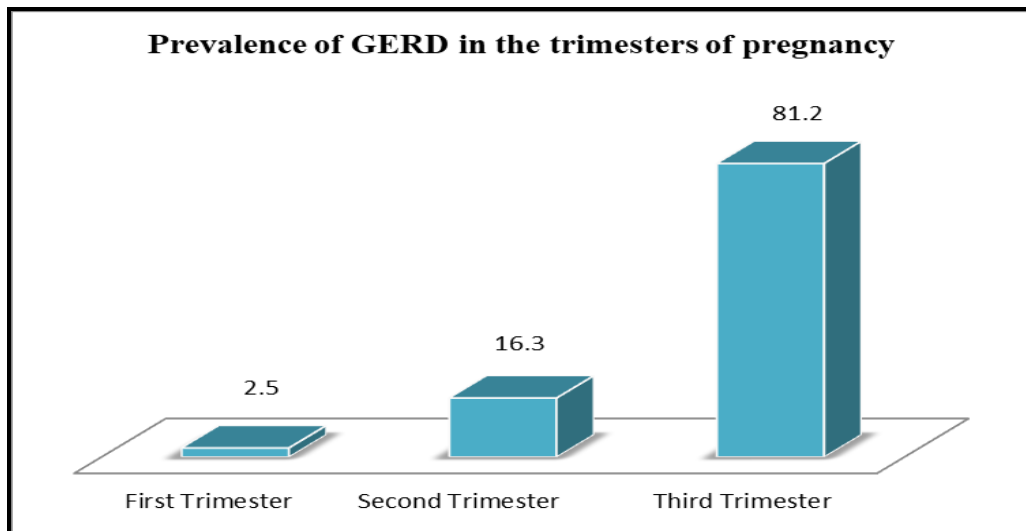| Items	Studied sample (80)	
	No	**%**
No of gravidity:		
Primigravida	35	43.8
Multigravida	45	56.2
No. of parity:		
Nullipara	35	43.8
Primipara	19	23.8
Multipara	26	32.4

Figure (1): The Prevalence of GERD in different trimesters of pregnancy among the studied sample no (80)

Table (3): Distribution of the studied sample regarding GERD history (n= 80):

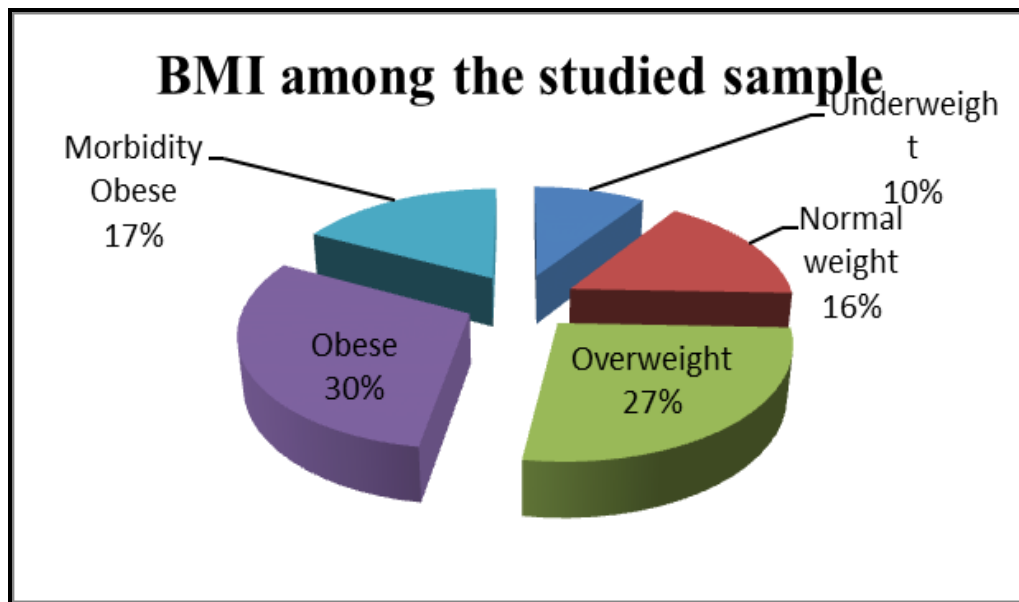| Items	Studied sample (80)	
	No	**%**
Family history of GERD:		
Yes	33	41.2
No	30	37.5
I don't know	17	21.3
Heartburn in previous pregnancies (Multigravida): (No=45)		
Yes	38	84.4
No	7	15.6
How long have you been suffering from GERD symptoms?		
Less than 1 yr	26	32.5
1 < 5 yrs.	41	51.2
5- 10 yrs.	13	16.3
Heartburn in present pregnancy		
Yes	70	87.5
No	10	12.5
Regurgitation in present pregnancy:		
Yes	63	78.8
No	17	21.2
Pregestational heartburn:		
Yes	59	73.7
No	21	26.3
Do you receive medication for GERD?		
Yes	69	86.2
No	11	13.8

Figure (2): BMI among the studied sample

Table (4): knowledge regarding GERD before and after educational intervention among studied sample (Pre and posttest) (n=80)

Items	Pretest				Posttest				T	P
	Incorrect answer		Correct answer		Incorrect answer		Correct answer			
	N	%	N	%	N	%	N	%		
Definition of GERD	62	77.5	18	22.5	3	3.8	77	96.2	14.898	.001**
Causes of GERD	69	86.2	11	13.8	11	13.7	69	86.3	11.314	.001**
Risk factors of GERD	61	76.2	19	23.8	14	17.5	66	82.5	8.616	.001**
Types of GERD	65	81.2	15	18.8	10	12.5	70	87.5	13.183	.001**
Signs and symptoms GERD	67	83.7	13	16.3	7	8.8	73	91.2	15.395	.001**
Diagnostic criteria of GERD	60	75.0	20	25.0	18	22.5	62	77.5	7.895	.001**
Complications of GERD	70	87.5	10	12.5	15	18.8	65	81.2	11.350	.001**
Treatment of GERD	66	82.5	14	17.5	11	13.8	69	86.2	12.477	.001**
Management of GERD	63	78.8	17	21.3	13	16.3	67	83.7	10.417	.001**

*Test used: paired sample T test.   * Statistically significant difference at P – value ≤ .05*
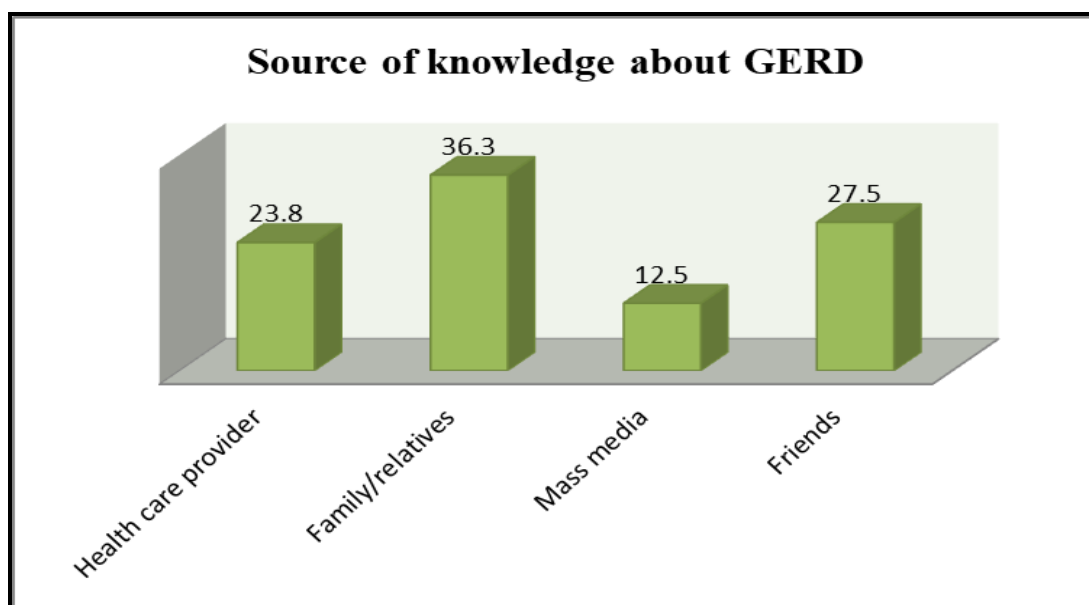*** Highly statistically significant difference at P – value ≤ .01*

Figure (3): The Source of knowledge about GERD

Table (5): Distribution of the studied sample according to their Life style regarding GERD before and after educational intervention (Pre and posttest) (N=80)

Life style dimensions	Pretest				Posttest				T	P
	Unhealthy lifestyle		Healthy lifestyle		Unhealthy lifestyle		Healthy Lifestyle			
	N	%	N	%	N	%	N	%		
Nutrition (7 questions)	63	76.8	17	21.3	5	6.3	75	93.7	14.432	.001**
Drinks (2 questions)	70	87.5	10	12.5	20	25.0	60	75.0	11.475	.001**
Sleeping (3 questions)	65	81.2	15	18.8	16	20.0	64	80.0	9.044	.001**
Clothing (1 question)	57	71.3	23	28.7	17	21.3	63	78.8	7.257	.001**
Weight (1 question)	67	83.7	13	16.3	40	50.0	40	50.0	4.050	.001**
Medication (4 questions)	55	68.8	25	31.2	14	17.5	66	82.5	7.204	.001**

*Test used: paired sample T test.   ** Highly statistically significant difference at P – value ≤ .01*

Table (6): Distribution of the studied sample according to their QOL regarding GERD before and after educational intervention (Pre and posttest) (N=80)

Items	Pretest				Posttest				T	P
	Poor QOL ≥ (60%)		Good QOL < (60%)		Poor QOL ≥ (60%)		Good QOL < (60%)			
	N	%	N	%	N	%	N	%		
1. How bad is your heartburn?	66	82.5	14	17.5	19	23.7	61	76.3	10.607	.001**
2. Heartburn when lying down?	54	67.5	26	32.5	13	16.3	67	83.7	9.113	.001**
3. Heartburn when standing up?	46	57.5	34	42.5	11	13.7	69	86.3	7.839	.001**
4. Heartburn after meals?	71	88.8	9	11.2	15	18.7	65	81.3	13.577	.001**
5. Does heartburn change your diet?	60	75.0	20	25.0	9	11.2	71	88.8	11.175	.001**
6. Does heartburn wake you from sleep?	50	62.5	30	37.5	17	21.3	63	78.7	7.448	.001**
7. Do you have difficulty swallowing?	32	40.0	48	60.0	18	22.5	62	77.5	4.094	.001**
8. Do you have pain with swallowing?	18	22.5	62	77.5	8	10.0	72	90.0	3.359	.001**
9. Do you have bloating or gassy feelings?	58	72.5	22	27.5	11	13.8	69	86.3	10.607	.001**
10. If you take reflux medication, does this affect your daily life?	33	41.3	47	58.8	16	20.0	64	80.0	4.617	.001**
11. How bad is your Regurgitation?	59	73.7	21	26.3	8	10.0	72	90.0	11.787	.001**
12. Regurgitation when lying down?	44	55.0	36	45.0	13	16.3	67	83.7	7.070	.001**
13. Regurgitation when standing up?	70	87.5	10	12.5	15	18.7	65	81.3	13.183	.001**
14. Regurgitation after meals?	64	80	16	20	22	27.5	58	72.5	9.344	.001**
15. Does regurgitation change your diet?	63	78.7	17	21.3	21	26.2	59	73.8	9.344	.001**
16. Does regurgitation wake you from sleep?	62	77.5	18	22.5	18	22.5	62	77.5	9.826	.001**

Test used: paired sample T test.   ** Highly statistically significant difference at P – value ≤ .01

Table (7): Distribution of the studied sample according to their total knowledge, lifestyle and QOL regarding GERD (Pre and posttest) (n= 80)

Total scores	Pretest		Posttest		T	P- Value
	No	%	No	%		
Knowledge about GERD (n = 80).						
Poor < (50%)	58	72.5	5	6.3		
Average (50- 75%)	16	20	6	7.5	17.829	.001**
Good > (75%)	6	7.5	69	86.3		
Mean ± SD	10.88 ± 1.63		16.73±2.23			
Lifestyle regarding GERD (n = 80).						
Unhealthy lifestyle < (60%)	61	76.3	7	8.8		
Healthy lifestyle ≥ (60%)	19	23.7	73	91.2	12.809	.001**
Mean ± SD	27.10±12.025		49.63±6.985			
QOL toward GERD (n = 80).						
Good QOL < (60%)	22	27.5	65	81.3		
Poor QOL ≥ (60%)	58	72.5	15	18.8	9.582	.001**
Mean ± SD	38.78 ± 13.484		16.54±20.410			

Test used: paired sample T test.   ** Highly statistically significant difference at P – value ≤ .01

Table (8): Association of total knowledge scores with selected socio-demographic in pre and posttest (N=80)

Variables	pretest			Posttest		
	Poor No (58)	Average No (16)	Good No (6)	Poor No (5)	Average No (6)	Good No (69)
Age						
18 < 25(NO= 20)	17	2	1	1	2	17
25<35 (NO= 34)	28	5	1	2	4	28
35-45 (NO= 26)	13	9	4	2	0	24
X^2 (P – value)	10.219(.04)*			3.259(.515) NS		
Residence						
Urban (NO= 36)	21	11	4	2	3	31
Rural (NO= 44)	37	5	2	3	3	38
X^2 (P – value)	6.596(.04)*			.111(.946) NS		
Level of Education						
Illiterate (NO= 8)	6	2	0	3	1	4
Primary (NO= 11)	7	4	0	1	1	9
Preparatory (NO= 22)	20	1	1	1	2	19
Secondary (NO= 25)	22	2	1	0	0	25
University (NO= 14)	3	7	4	0	2	12
X^2 (P – value)	29.697(.001)**			20.087 (.01)*		
Occupation						
Housewife (NO= 38)	33	4	1	1	3	34
Employed (NO= 42)	25	12	5	4	3	36
X 2 (P – value)	7.589(.020)*			1.619(.445) NS		
Income						
Insufficient (NO= 23)	17	4	2	2	3	18
Sufficient (NO= 40)	29	9	2	2	2	36
Sufficient and save (NO=17)	12	3	2	1	1	15
X^2 (P – value)	1.055(.901) NS			1.902(.754) NS		

*NS= Not statistically significance   * Statistically significant difference at P – value ≤ .05*
*** Highly statistically significant difference at P – value ≤ .01*

Table (9): Association of total lifestyle scores regarding GERD with selected socio-demographic in pre and posttest (N=80)

Variables	Pretest		Posttest	
	Unhealthy lifestyle No (61)	Healthy lifestyle No (19)	Unhealthy lifestyle No (7)	Healthy lifestyle No (73)
Age				
18 < 25(NO= 20)	14	6	2	18
25<35 (NO= 34)	30	4	4	30
35-45 (NO= 26)	17	9	1	25
X^2 (P – value)	4.823(.090) NS		1.209(.546) NS	
Residence				
Urban (NO= 36)	23	13	3	33
Rural (NO= 44)	38	6	4	40
X^2 (P – value)	5.523(.019)*		.014(.905) NS	
Level of Education				
Illiterate (NO= 8)	6	2	3	5
Primary (NO= 11)	10	1	1	10
Preparatory (NO= 22)	21	2	1	21
Secondary (NO= 25)	21	4	2	23
University (NO= 14)	3	11	0	14

Variables	Pretest		Posttest	
	Unhealthy lifestyle No (61)	Healthy lifestyle No (19)	Unhealthy lifestyle No (7)	Healthy lifestyle No (73)
X^2 (P – value)	29.856(.001)**		10.131(.04)*	
Occupation				
Housewife (NO= 38)	33	5	6	32
Employed (NO= 42)	28	14	1	41
X^2 (P – value)	4.484 (.034)*		4.492(.034)*	
Income				
Insufficient (NO= 23)	21	2	5	18
Sufficient (NO= 40)	31	9	1	39
Sufficient and save (NO=17)	9	8	1	16
X^2 (P – value)	8.013 (.018)*		6.992(.03)*	

*NS= Not statistically significance   * Statistically significant difference at P – value ≤ .05*
*** Highly statistically significant difference at P – value ≤ .01*

Table (10): Association of total QOL scores regarding GERD with selected socio-demographic in pre and posttest (N=80)

Variables	pretest		posttest	
	Good QOL (No=22)	Poor QOL (No=58)	Good QOL (No=65)	Poor QOL (No=15)
Age				
18 < 25(NO= 20)	6	14	18	2
25<35 (NO= 34)	7	27	24	10
35-45 (NO= 26)	9	17	23	3
X^2 (P – value)	1.538(.464) NS		4.430(.109) NS	
Residence				
Urban (NO= 36)	12	24	36	8
Rural (NO= 44)	10	34	29	7
X^2 (P – value)	1.117(.291) NS		.021(.886) NS	
Level of Education				
Illiterate (NO= 8)	3	5	5	3
Primary (NO= 11)	4	7	10	1
Preparatory (NO= 22)	3	19	21	22
Secondary (NO= 25)	4	21	21	25
University (NO= 14)	8	6	8	14
X^2 (P – value)	10.784(.03)*		10.898(0.028)*	
Occupation				
Housewife (NO= 38)	10	28	33	5
Employed (NO= 42)	12	30	32	10
X^2 (P – value)	0.051 (.821) NS		1.486(.223) NS	
Income				
Insufficient (NO= 23)	6	17	16	7
Sufficient (NO= 40)	10	30	33	7
Sufficient and save (NO=17)	6	11	16	1
X^2 (P – value)	.666(.717) NS		3.950(.139) NS	

*NS= Not statistically significance   * Statistically significant difference at P – value ≤ .05*
*** Highly statistically significant difference at P – value ≤ .01*

Table (11): Correlation between studied student's knowledge, lifestyle and QOL regarding GERD in pretest and posttest

Variables	Pretest			Posttest		
	Knowledge	Lifestyle	QOL	Knowledge	Lifestyle	QOL
Knowledge						
r. value	1	.912	.990	1	.805	.530
P. value	-	.001**	.001**	-	.001**	.001**
Lifestyle						
r. value	.912	1	.906	.805	1	.305
P. value	.001**	-	.001**	.001**	-	.006**
QOL						
r. value	.990	.906	1	.530	.305	1
P. value	.001**	.000**	-	.001**	.006**	-

*** Correlation is significant at the 0.01 level (2- tailed).*   ** Correlation is significant at the 0.05 level (2- tailed).*

Table (1): Illustrates distribution of the studied sample according to their sociodemographic characteristics, it showed that 42.5% of studied sample their age between 25<35 years, with Mean and SD 31.99±7.14 years, 55% were from rural area. 31.3% of them had Secondary education and 52.5% were employed.

Table (2): Demonstrates distribution of the studied sample regarding their obstetrical history, it reveals that 56.2% of studied sample were multigravida and 43.8% of them were Nullipara.

Figure (1): Illustrates the Prevalence of GERD in different trimesters of pregnancy among the studied sample. It shows that 81.2 % of them were in the third trimester.

Table (3): Demonstrates distribution of the studied sample regarding GERD history; it reveals that 41.2 % of studied sample had a family history of GERD, 84.4 % of multigravida had heartburn in previous pregnancies, and 51.2% were suffering from GERD from 1 – 5 yrs. As regards heartburn and regurgitation in present pregnancy there were 87.5%, 78.8% of them had heartburn and regurgitation in present pregnancy respectively while 73.7% and 86.2% had reported pregestational heartburn and receive medication for GERD respectively.

Figure (2): Represents BMI among the studied sample. It reveals that 30 % of them were obese.

Table (4): Illustrates knowledge regarding GERD before and after educational intervention among studied sample. It shows that there was significant increase in all items of participants knowledge about GERD after the educational intervention with highly statistically significant improvement in each parameter of their knowledge (where p-value = 0.001 in each one)

Figure (3): Illustrates the source of knowledge about GERD among the studied sample. It reveals that 36.3% of the studied sample get their information from family and/ relatives followed by friends 27.5%.

Table (5): Illustrates distribution of the studied sample according to their Life style regarding GERD before and after educational intervention. It reveals that the studied sample had unhealthy lifestyle in pretest that improves in posttest. It shows that there was significant change in all items of participants unhealthy life style after the educational intervention with highly statistically significant improvement in each Life style dimension (where p-value = 0.001 in each one).

Table (6): Illustrated distribution of studied sample according to QOL regarding GERD before and after educational intervention. It reveals that the studied sample had poor QOL in pretest that decreased in posttest. It shows that there was significant improvement in all items of participants QOL after the educational intervention with highly statistically significant (where p-value = 0.001 in each one)

Table (7): Demonstrates distribution of the studied sample according to their total knowledge, lifestyle and QOL regarding GERD, it reveals that 72.5 % of studied sample had poor knowledge about GERD in pretest which decreased to 6.3% in posttest. Mean score of their knowledge was 10.88 ± 1.63 in pretest, increased to 16.73±2.23 in posttest with highly statistically significant improvements in their knowledge level.

Additionally, Lifestyle regarding GERD, it reveals that 76.3 % of studied sample had unhealthy lifestyle regarding GERD in pretest reduced to 8.8 % of in posttest. Mean score of their Lifestyle regarding GERD was 27.10±12.025 in pretest, increased to 49.63±6.985in posttest with highly statistically significant improvements in their Lifestyle.

Also, QOL toward GERD, it reveals that 72.5 % of studied sample had poor QOL toward GERD in pretest reduced to 18.8 % of in posttest. Mean score of studied sample QOL toward GERD were 38.78 ± 13.484 in pretest that reduced to 16.54±20.410 in

posttest with highly statistically significant improvements in their QOL toward GERD.

Table (8): Illustrates Association of total knowledge scores with selected socio-demographic in pre and posttest**.** It shows that there was statistically significant relation between participants total knowledge about GERD and their age, residence, occupation in pretest where P-value were 0.04, 0.04, 0.02 respectively and highly statistically significant relation between participants total knowledge about GERD and their level of education in pretest versus statistically significant posttest where P-value were 0.000 and 0.01 respectively.

Table (9): Represents association of total lifestyle scores regarding GERD with selected socio-demographic in pre and posttest. It shows that there was statistically significant relation between participants total lifestyle scores regarding GERD and their demographic data related to occupation and income in pretest and posttest where P-value were, 0.034, 0.018 and 0.034, 0.03 respectively, also there was highly statistically significant relation between participants total lifestyle scores regarding GERD and their level of education in pretest versus statistically significant relation in posttest where P-value were 0.000 and 0.04 respectively.

Table (10): Demonstrates association of total QOL scores regarding GERD with selected socio-demographic in pre and posttest**.** It reveals that there was statistically significant relation between participants total QOL scores regarding GERD and their demographic data related to level of education in both pretest and posttest where P-value were 0.03 and 0.028, respectively. Also, it shows that the relationship between age residence, occupation and income and participants total QOL scores regarding GERD was not statistically significant.

Table (11): Shows correlation between studied student's knowledge, lifestyle and QOL regarding GERD in pretest and posttest reveals that there was a positive correlation between studied sample's knowledge about GERD, Lifestyle and QOL in pretest and posttest with statistically significant differences where p_ value was .001.

Discussion

Gastroesophageal reflux disease (GERD) in pregnancy is common in women who become pregnant at a young age. Gastro esophageal reflux (GER) is the passage of the stomach's contents into the esophagus. The presence of esophageal structural changes and the occurrence of symptoms affecting individuals quality of life indicate (GERD). Gastro esophageal reflux develops in 30 to 50% of pregnant women, but the incidence may be up to 80% in some patient groups (**Herregods et al., 2015**)

The intent and essence of the present study is to evaluate the impact of educational guidelines on improving knowledge, lifestyle and quality of life for pregnant women with gastro esophageal reflux disease (GERD).

Regarding age, less than half of the participants' age was between 25–35 years, with a mean 31.99±7.14 years, this came into contact with the study of **Lee et al. (2021)** who studied "prevalence and prediction of gastro esophageal reflux disease in pregnant women and its effect on quality of life and pregnancy out comes" and found that mean age among studied group 32 ±3.61 yrs. While contradicted with the study of **Ramu et al. (2011)** entitled "Prevalence and risk factors for gastro esophageal reflux in pregnancy" which found that the mean age of the pregnant Indian women was (23.68±3.37) years. This is because girls refuse to marry unless they have completed their education and achieved success.

The current study also denoted that more than half of the sample resides in rural areas. This is agreed with **Ahmed & Hassan (2021)** who studied the" Impact of educational program for patients with gastroesophageal reflux disease on lifestyle change and home remedies" and concluded that nearly two thirds of the studied sample were from rural areas. According to the authors, various factors contribute to this occurrence, including low social and economic conditions, a lack of medical facilities, a lack of awareness, and a shortage of highly skilled doctors among pregnant women in rural areas.

In terms of education, nearly one-third of the sample was from secondary school, which contradicted the findings of a study by **Jemilohun et al. (2015)** on "Prevalence of gastrointestinal symptoms and related drug use among pregnant women of South-Western Nigeria," which found that nearly half of the sample was from tertiary education (university education). disagreed with **Lee et al. (2021),** who found that the great proportion of the study sample had high education. This may be as a result of the great proportion of the study sample being from rural areas where they didn't prefer to complete until high education.

By looking at obstetric history, this study found that more than half of the sample was multigravida. This came in accordance with the study by **Jemilohun et al. (2016)** regarding "A comparison between the prevalence of gastroesophageal reflux disease among South-Western Nigerian pregnant women to that of the non-pregnant ones" and concluded that more than two thirds of the sample were multigravida. This may be due to GERD isn't usually identified in the 1st pregnancy but in the subsequent pregnancies. also agreed with the study of **Lee et al. (2021),** who

concluded that more than three-quarters of the sample were multigravida.

Regarding the prevalence of GERD in the 1st, 2nd and 3rd pregnancy trimesters, this study showed that more than four fifths of the participants have GERD in their third trimester. This agreed with **Jemilohun et al. (2015)** who found that nearly two-thirds of pregnant women in a South-Western Nigeria sample developed GERD in the third trimester. This may be due to the pressure of the gravid uterus on the esophagus that was affected by the return of gastric acid, causing signs and symptoms of GERD.

In relation to BMI, findings of the present study revealed that nearly one third of the studied sample were obese with a BMI of (30–39.9) kg/m2. This contradicted the findings of **Lee et al. (2021)** who discovered that the BMI of pregnant women with GERD was (25.29 ± 2.29) kg/m2, as well as **Jemilohun et al. (2015)** who discovered that the BMI of pregnant women was (25.8±4.53) kg/m2. This may be explained by the fact that once women in our country become pregnant, they increase their dietary intake as they believe they are feeding two people, resulting in a higher BMI.

Concerning GERD history among participants, results revealed that more than two fifths had a positive family history of GERD and more than four fifths of them had heartburn in previous pregnancies. Also, it was found that a great proportion of them had heartburn and regurgitation in the present pregnancy and received medication for GERD. These results matched with those of **Dall'Alba et al. (2015),** who studied "Health-related quality of life of pregnant women with heartburn and regurgitation" and reached the same results. This is due to the fact that signs, symptoms, and family history may all be contributing factors that cannot differ from one country to another.

By looking for sources of information about GERD, it was found that more than one third of the sample had their information from their family members and relatives. This came in contact with the study of **Ahmed & Hassan (2021)** who found that nearly one third of the sample gets their information from family members as well as health care providers representing the same ratio. This can be justified by the fact that any woman facing a difficulty seeks advice from her family first.

In relation to total knowledge regarding GERD pre and post educational intervention, current results revealed that there was an improvement among all items of participants' knowledge about GERD after applying an educational program with a highly statistically significant difference at P = 0.001 in each item. This came in accordance with **Ahmed & Hassan (2021),** who stated that there was a statistically significant difference between pre, post,

and follow-up tests after applying an educational program regarding knowledge level about GERD. This clarifies the impact of the intervention provided.

In relation to lifestyle regarding GERD before and after educational intervention, a statistically significant improvement was found among all unhealthy lifestyle items after providing educational intervention at P = 0.001 in each item. This demonstrates the need for such instructional sessions in order to modify and correct these GERD-related lifestyles. This is shown in the study of **Jemilohun et al. (2016)** who found that gastroesophageal reflux symptoms in pregnancy can be managed by lifestyle modification and the use of antacids as may be required. They also agreed with the study by **Wikman et al. (2020),** entitled "Physical activity, obesity and gastroesophageal reflux disease in the general population" and mentioned that lifestyle modifications for GERD include eating small meals, choosing low-fat foods, reducing intake of chocolate and alcohol.

Looking at QOL in relation to GERD before and after educational intervention, the current findings revealed a high statistical significance improvement in all items of participants' QOL post intervention, with P = 0.001 in each one, which agreed with **Lee et al. (2021)**, who discovered that some items of QOL showed a statistically significant difference regarding emotions, sleeping, food intake, and vitality. So, there was a necessity to improve QOL among affected pregnant women by improving their knowledge, and this supports the fact that when pregnant women are given accurate health information regarding GERD and are knowledgeable about healthy lifestyle, their QOL improves.

In terms of total knowledge, lifestyle, and QOL regarding GERD among the studied sample, a statistically significant improvement was found in their knowledge level and lifestyle pre and posttest, respectively, at P = 0.000. This agrees with **Ahmed & Hassan (2021),** who reported that there was an improvement in patients' knowledge immediately after an educational program. This may be due to clearing up ambiguous information about the disease, which may affect positively the total level of knowledge.

The present study concluded that there was an improvement in patients' QOL between pre and posttest, respectively, at P = 0.001. This may be due to poor QOL's effecting negatively on the overall fetal and maternal health. Therefore, it is very important to improve QOL among patients suffering from GERD and that a pregnant woman's quality of life will improve if she gets accurate knowledge about the disease and adopts good lifestyle habits during her pregnancy. These results came in contact with the

study entitled "Impact of gastroesophageal reflux disease symptoms on the quality of life in pregnant women: a prospective study" that was done by **Malfertheiners et al. (2017)** and also agreed with **Lee et al. (2021),** in which both studies found that QOL was significantly different between pregnant women with and without GERD.

Regarding relations between total knowledge scores with selected socio demographic data pre and posttest, it was found that there was a statistically significant relation between participants' total knowledge with their age, residence, and occupation in the pretest at P (0.04, 0.04, and 0.02) respectively and a highly significant difference with their level of education at p = 0.000 posttest. And from the researchers' point of view, this correlation may be due to the better experience obtained throughout years of life. Place of residence (rural and urban) can also affect the level of knowledge, as urban residents usually have a higher level of knowledge as a great number continue their higher education in urban areas than in rural areas, as well as health services are easily accessible.

On the other hand, occupation was found to be related to a higher level of knowledge. This can be rationalized as working women may discuss these issues with their friends in the workplace. Thus, it provides them with a better opportunity to improve their knowledge.

In the same context, knowledge level was found to be related to a higher level of education. This is a normal finding, as the higher one's educational degree, the better one's chances of gaining relevant experience and knowledge.

In terms of the correlation between total lifestyle scores for GERD and chosen socio -demographic variables, it was discovered that occupation and income had a statistically significant relationship. This is considered a logical relation as working women have a lifestyle different from a housewife. This difference render to relations and contact with others in the workplace and moving outside the home every day and extra duties make a variation in their lifestyle as well as this can be explained by the fact that high-income patients are more likely to maintain a healthy lifestyle, such as buying foods and beverages that reduce heart burn, purchasing and wearing loose-fitting clothing, and visiting the doctor on a regular basis.

Also, this study reported that income affects lifestyle scores. This came in accordance with **Meining & Classman (2018),** who studied "the role of diet and lifestyle measures in the pathogenesis and treatment of gastroesophageal reflux disease" and found that diet is an important factor for the development of GERD symptoms. They also agreed with the research

of **Pandolfino et al. (2019)** about "Esophagogastric junction morphology predicts susceptibility to exercise-induced reflux" and concluded that consumption of meat was confirmed as a risk factor for GERD. Higher fat content in meat is related to increased risk because fat delays stomach emptying. This can be rationalized by the fact that well-being is usually related to overconsumption of meat.

Also, these findings revealed that there was a positive correlation between studied sample knowledge about GERD, lifestyle, and QOL in pretest and posttest at P = 0.000. This was compatible with **Wong et al. (2020)**, who studied "Prevalence, clinical spectrum, and health care utilization of gastroesophageal reflux disease in a Chinese population" and reported that diet is an important factor for the incidence of GERD symptoms and suggested that eating small amounts of food frequently and slowly may decrease GERD symptoms. Also agreed with the research of **Du. Jeong et al. (2017)** about "the degree of disease knowledge in patients with gastroesophageal reflux disease", who concluded that there was a highly statistically significant correlation between total knowledge and lifestyle changes such as type of drinking, type of food, and type of exercise. This may be as changing lifestyle is the basic treatment choice, especially if it is a precipitating factor of a specific disorder. Also came in contact with **Wikman et al. (2020)**, who mentioned that there was a highly statistically significant correlation between total patients' practices scores and lifestyle change.

In the light of the above-mentioned findings, the hypothesis, which stated that "the educational guidelines will improve knowledge, lifestyle, and quality of life for pregnant women with gastro esophageal reflux disease (GERD)" was supported.

Conclusion:

The present research concluded that there was a highly statistically significant difference between total knowledge, total lifestyle, and total QOL scores, P<0.001 before and after the implementation of educational guidelines. Also, there was a positive correlation between studied sample's knowledge about GERD, Lifestyle and QOL in pretest and posttest with statistically significant differences. So, application of educational guidelines has a good impact on improving knowledge, lifestyle, and quality of life for pregnant women with GERD.

Recommendations:

- Provision of in-service educational program and ongoing supervision in rural regions to increase pregnant women's awareness of GERD and the importance of lifestyle adjustments.

- Health information about gastroesophageal reflex disease should be published in the mass media, or handouts or booklets should be prepared and given through health care facilities.
- A simple illustrations thorough pamphlet, including updated guidelines for gastroesophageal reflex disease, should be provided to pregnant women, particularly those who are suffering from it prior to pregnancy, and should be properly explained with photographs for those who have not completed their education.
- Implementation of a teaching program at a prenatal clinic, complete with an information brochure, as an integral element of therapeutic remedy.

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