Assessment Dietary Food Intake Habits and Physical Activity in Post-Partum Period

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Abstract

Background: Numerous health benefits are associated with achieving optimal diet and physical activity behaviors postpartum. So understanding of this pattern is an important health consideration. **The aim** of this study was to evaluate maternal dietary intake and physical activity habits during postpartum period. **Subjects and Method: Design:** A descriptive cross-sectional research design was used in this study. **Setting:** This study was conducted at the outpatient clinics to four hospitals chosen by random stratified cluster samples. Representing rural and urban areas in Damietta city namely Alazher, General, Altakhasosy & Kafr-saad hospitals. **Subjects:** Purposive sample of 290 postpartum women**. Tools of** data collection: Three tools were designed and used: **Tool (I):** Structured interview sheet included three parts: **Part (1):** Socio-demographic, and reproductive data, **Part (2):** Assessment of postpartum women, **Part (3):** Questions related to women's knowledge. **Tool (II):** The Postpartum Diet Questionnaire and **Tool (III):** Postpartum physical activity Questionnaire. **Results**: there was a positive correlation between mother's knowledge about diet during post-partum period and overall physical activity significant correlation p<0.001. Sedentary women were highly significant association to overweight and obese (p=<0.001) and women compliance with overall physical activity tend to had normal weight. **Conclusions:** Healthy diet and physical activity were less among postpartum women yet shows that, a positive correlation between mother's knowledge about diet during post-partum period and overall physical activity significant correlation p.0<001. Strategies which employ more intensive support, to postpartum women, as opposed to diet & physical activity are an important consideration for future research. **Recommendation:** Health education program is needed to raise awareness of primiparous women about the effect of nutritional habits on engagement in different physical activities during the postpartum period.

Keywords: *Maternal Dietary Intake, Physical Activity, and Post-Partum Period.*

Introduction

Numerous health benefits are associated with achieving optimal diet and physical activity behaviors during and after pregnancy. Understanding predictors of these behaviors is an important public health consideration, yet little is known regarding associations between clinician advice and diet and physical activity behaviors in postpartum women **(Tahir, Haapala, Foster, Duncan, Teague, Kharbanda et al., 2019).**

Consuming a wide variety of dietary foods during pregnancy is important to ensure that the nutritional requirements of both mother and baby are met. In some situations, supplementation of some vitamins or minerals may be advisable. Regular low to moderate-intensity physical activity is generally safe during pregnancy with likely benefits for mother and baby. The nutritional status of a woman before and during pregnancy plays a vital role in fetal growth and development. While requirements for some nutrients (e.g. iron, folic acid) increase, the basic principles of healthy eating remain the same **(Pignone, Ammerman, Fernandez, Orleans, Pender, Woolf et al., 2017).**

Adopting healthy dietary and physical activity behaviors during the postpartum period is particularly important to promote optimal maternal health, both in the short and long term. A diet adequate in fruit and vegetables and low in fat has been shown to play a vital role in reducing the risk for many diseases and poor dietary habits linked with the development of diseases including type 2 diabetes, hypertension, cardiovascular

disease and cancers **(Hiza, Casavale, Guenther & Davis, 2018).**

Dietary pattern postnatal contain greater amount and variety of healthy foods, such as meat, fish, oils, nuts, seeds, cereals, beans, vegetables, cheese and milk to support her mother's health and strength, reassure the postnatal mother that can eat any normal foods, these will not harm the breastfeeding baby, encourage them to ensure that the woman eats enough **(World Health Organization, & UNICEF, 2015).** Specifically, healthy eating for newly postnatal women is an important to sufficiently support breastfeeding. However it is common for women of all ages not to meet dietary intake recommendations. Although some women may eat healthily during pregnancy these habits often discontinue following delivery with decreases in adequacy of fruit and vegetable intake **(Van der Pligt, Olander, Ball, Crawford, Hesketh, Teychenne, Campbell et al., 2016).**

Physical activity can be defined as any body movement that involves the use of one or more large muscle groups and raises the heart rate. This includes sport, exercise and recreational activities and incidental activity that accrue throughout the day **(Lum, Beaudoin, & Caton, 2018).** Regular physical activity during the postpartum period has been associated with improved mental health as well as improved cholesterol levels and insulin, and increased chance of women returning to pre-pregnancy weight. Further, physical activity has been shown to be a critical influence on maternal weight and predicts postpartum weight

retention, 12 months after childbirth **(Falciglia, Piazza, Ritcher, Reinerman & Lee, 2020).** Physical activity in the postpartum period improves blood circulation, strengthens the abdominal and spine muscles, stimulates lactation, accelerates the constriction of the uterus, prevents urogynecological dysfunction, as well as improves the mental and physical condition of women's **(Kernot, Old's & Lewis, 2021).**

Postpartum period is a time of profound transition making great demands on the woman's resilience and capacity to adapt. So, postpartum care includes the prevention, early detection and treatment of complications and diseases. Also, provision of advice and services regarding breastfeeding, births spacing, immunization, & maternal nutrition **(Akahasi & Tamakoshi, 2016).**

Therefore, a good postpartum care in addition to a well-balanced diet is very important for the health of a woman. The paramount importance of nutrition of a woman during postpartum is widely recognized and has received increasing attention in recent years. In many third world countries including Egypt, malnutrition is endemic, fertility rates are high, and women enter the reproductive stage at an early age and subsequently attain high parity and most of the time food based on cultural beliefs and practices in which food is one of the most universal symbols of culture, holding one of the key point in postpartum period **(Ministry of Health and Population (Egypt), ElZanaty, 2015).** Food habits and practices vary among women and are influenced by culture norms.

Whether foods supplies are limited or abundant, women tend to develop trends in eating that are derived from socio-cultural background. These will in turn influence postpartum eating practices **(Chen, Wang, Ding& Shan, 2019).**

Nurses have a vital role in providing nutritional education to postpartum women. So, nurses should seek every opportunity to help postpartum women select foods within personal preferences that will promote own well-being and successful lactation. Also, it is important that nurses be able to identify women who are at risk for nutritional deficiencies and make sound dietary recommendations **(Tahir, Haapala, Foster, Duncan, Teague, Kharbanda et al., 2019).** This may lead to a healthier nutritional practice during postpartum period and positively reflects on both women and newborns well-being **(Savard, Lemieux, Carbonneau, Provencher, Gagnon, Robitaille et al., 2019).**

Significance of the study

A better understanding of the provision of advice and recommendations women receive and if these are associated with diet and physical activity behaviors is necessary to identify opportunities for provision of healthy lifestyle support for new mothers during postpartum. Moreover, the Ministry of Health and Population, Arab Republic of Egypt **(Egypt Ministry of Health and Population, 2015),** recommended that women need the essential information during the postpartum period regarding nutrition, self-care hygiene, sexual life and contraception before discharge from the hospital. In addition, **(Tawfik, Hanna, Abdel-Maksoud, 2015)** in her study about "Utilization of

postnatal care services among women in El-Behera governorate, Faculty of Nursing, Alexandria University, reported that, health teaching during the postpartum period in the form of nutrition from health care providers is one of the common needs as reported by the mothers during this period. Therefore, this study was conducted to evaluate maternal dietary intake and physical habits of women during the postpartum period.

Aim of the study

This study aimed to evaluate maternal dietary food intake and physical activity habits during postpartum period.

Research questions

1. What are the dietary habits of women during the postpartum period?
2. What is the habit of physical activities during postpartum period?
3. Are there is a relationship between dietary habits & physical activities of women during postpartum period?

Subjects and Methods

Research design:

A descriptive cross-sectional research design was used.

Study setting:

This study was conducted at the outpatient clinics of four hospitals chosen by random stratified cluster samples. Representing rural and urban areas in Damietta city namely Alazher, General, Altakhasosy & Kafrsaad hospitals which is affiliated with Port-Said University in Egypt.

Study Subjects

Purposive sample of postpartum women and fulfilled the inclusion criteria, (1) Primiparous women, (2) Healthy and breastfeeding mother, and (3) Free from medical and obstetrical disorders.

Sample Size:

The sample size of 290 postpartum women was determined by using the following equation **(Charan & Biswas, 2013)**

$$\text{Sample size} = \frac{Z1-\propto/2^2\, p\,(1-p)}{d^2}$$

Where:

$z1-\alpha$

$\therefore$ 2

$=$ apercentile of standard normal distribution

by confidence level $=$ 1.96

P=Expected proportion in population based on previous studies (prevalence women in postpartum period=7.5 % according to **(EDHS, 2014)**.

D: absolute error or precision (5%)

Sample size

$$= \frac{1.96^2 x 0.75(1-0.75)}{(0.05)2}$$

$$= 290$$

Tools of data collection:

Three tools were designed and used for data collection:

Tool (I): Structured interview sheet for the women's: This questionnaire sheet was developed based on **(Weiss & Lokken, 2009).** It included three parts:

Part (1): Socio-demographic data as (mother's age, marital status, education level, occupation, income, husband education and job, crowding index, as well as the identification data as the address and telephone number for follow-up. Reproductive history such as; gravity, parity, number of abortions, birth interval and sexual activity.

Part (2): Assessment of postpartum women: This form was used to record weight, height, the mode of delivery and postnatal data such as vital signs, episiotomy, blood loss, any complications**.**

Part (3): Questions related to women's knowledge about physiological changes during the postpartum period and health problems during postpartum period such as perineal pain, back pain, constipation, breast problems, urinary retention and hemorrhoids.

Tool (II)*:* The Postpartum Diet Questionnaire:

This tool was found on the WIC (Special Supplemental Nutrition Program for Women, Infants and Children) website and created by **Robaina, & Martin, (2013**), was modified by **(Osailan, 2014)** and adopted by the researcher to collect information from mothers during the postpartum period about food consumption and intake of nutrients dietary supplements. This questionnaire consisted of eighteen questions.

Scoring System:

For the Postpartum Diet Questionnaire sheet; the possible response was "Yes", and "No". Yes, will be given two points, "No" will be given one. For open ended questions, the study group's answers will be compared with a model key answer, where (2) score is given to completely correct answer, (1) for an incompletely correct answer, and (0) for incorrect answer. These scores will be converted into a percentage score. Means and standard deviations are calculated.

Tool (III): Postpartum physical activity Questionnaire (PPAQ).

This tool was adapted from (**Cohen, Plourde, & Koski, 2013).** The PPAQ is a validated, self-administered questionnaire that took an average 10–15 minutes to complete, and has been used to assess the current physical activity levels of women during postpartum phase. This questionnaire was composed of 32 items, grouped into different types of activities [ie, household/care giving (13 items), occupational (5 items), sports/exercise (8 questions), transportation (3 items), and as well as inactivity (3 items)]. Specifically, the semi quantitative questionnaire asked women to estimate the duration and frequency spent per activity (ie, "none," "less than1/2 hour per day," "1/2 to almost 1 hour per day," "1 to almost 2 hours per day," "2 to almost 3 hours per day," "3 or more hours per day") during the current one month. Women were not asked about specific durations, but rather acknowledged the time spent performing an activity by checking-off the appropriate duration presented in the PPAQ as a range. Women were also given the opportunity to provide 2 activities that were not listed on the questionnaire. These intensities were individually estimated using the compendium of physical activity.

Scoring System

Activities are also classified by intensity sedentary = (<1.5 METs) (Means and standard deviations are calculated) light (1.5–<3.0 METs), moderate (3.0–6.0 METs), or vigorous (>6.0 METs) **(Xiang et al., 2016).**

Tools Validity& Reliability:

After developing the study tools and before the data collection phase, five expertise of professors have tested the tools' content validity. Those five destinations were "Obstetrics and Gynecological & Family and community health nursing departments at Faculty of nursing, Port Said University. All of them have revised the tools and reassured tools 'clarity, relevance, comprehensiveness, understanding and ease for implementation. The expertise' opinions are elicited regarding the tool format, layout, and consistency. The required adjustments are made accordingly.

Reliability was ensured by calculating Cronbach's alpha coefficients. Its value was (0.76 for the knowledge questionnaire), which indicates high reliability.

Pilot study

A pilot study was conducted on 10% (29) of postpartum primiparous women to test the clarity of the questionnaire, applicability, and estimated time to complete the instrument. Then some items were modified according to the responses of the participants in the pilot study. The sample included in the pilot study was excluded from the total study sample.

Field work

Once permission is given to begin conducting this study from the official

and trusted women at the general hospital. The researchers immediately began collecting data and contacted each potential mother to explain the purpose and nature of the study.

The researchers confirmed that participation in the study was

completely voluntary, and that his identity and the confidentiality of the answers were guaranteed. Participants were asked to sign a consent form. Data collection tools were distributed to the women after explaining their purpose. The total time each mother had to complete it ranged from 45 minutes to an hour. Data were collected from July 2019 to October 2019.

Administrative design:

An official letter signed by the Dean of the Faculty of Nursing at Port Said University was sent. Accordingly, approval was given to conduct the study and collect the sample by the hospital's Outpatient Clinics Directorate.

Ethical Considerations:

Approval to conduct the proposed study was obtained from public hospital officials. The researchers identified themselves as mothers who met the inclusion criteria; The purpose and nature of this study were then explained, after which informed consent was obtained from the mothers who agreed to participate in the study. The researchers confirmed that participation in the study was completely voluntary; They were assured of anonymity and complete confidentiality through data coding, and they had the right to withdraw from the study at any time without any consequence.

Statistical analysis:

Data were entered and statistical analysis was performed using the SPSS 23.0 statistical software package. Descriptive statistics included frequencies and percentages for qualitative variables, and methods and standard deviations for

quantitative variables, once descriptive statistics and frequencies were done to examine normality and confirm whether any deviation or kurtosis was found. Inferential statistics such as (Chi-square test and ANOVA test) were used. The Pearson correlation coefficient was used to examine the association between variables. For all statistical tests that were used, the significance threshold was fixed at the 5% level (P value) and was highly significant at P<0.001.

Results

Table 1: shows that, (62.2.0%) of the studied age group ranged from between 20 to -<30 with mean age 27.04 ± 5. 67 years. Concerning educational level, near half of the studied mothers (46.9%) had intermediate, while one third of studied mothers (32.8%) mention their income is not enough. Body mass index of the women's weight and height were 78.73 kg.

Table 2: illustrates studied women knowledge about diet during post-partum period. It shows that, all studied women (100%) knew suitable time of diet post-partum. 45.9% of them had correct knowledge of suitable time of diet post-partum and the usual drink postpartum known by 86.2% of them. Concerning knowledge of the usual protein foods eating most of them (92.4%) knew it.

Table 3: reveals the knowledge mothers total scores of about diet during post-partum period the mean with 27.15 ± 1.81. Mothers total scores of about diet during post-partum period.

Table 4: Illustrates the relation between income and body mass as reveals in the table there is statistically significant association between total score of income.

Table 5: Illustrates the relation between weight before delivery and recent weight as in the table there is a high statistically significant association between weight before delivery and postpartum P=0.001.

Table 6: demonstrates that, all studied women physical activity post-partum exercises, or work considered as sedentary behavior. However, less than one fifth of them performed light physical activity Thus table shows that, four fifth was sedentary compared to one fifth of them participated in light physical activity.

Table 7: shows that, physical activity of studied women during the post-partum period with mean 18.17± 20.35 and exercise with mean 0.47 ± 1.81, while overall physical activity with mean 20.49 ± 22.47 respectively.

Table 8: shows a positive significant statistically correlation between mother's knowledge about diet during post-partum period and overall physical activity where p-0.00147 respectively.

Table 9: displays that, sedentary women were highly significant association to overweight and obese p=0.001 and women compliance with overall physical activity tend to be normal.

Table (1): Distribution of the studied women according to socio demographic data (n = 290)

Socio demographic data	No.	%
Age (years)		
<20	23	7.9
20–<25	81	27.9
25–<30	88	30.3
30–<35	51	17.6
≥35	47	16.2
Min. – Max.	18.0 – 39.0	
Mean ± SD.	27.04 ± 5.67	
Living Place		
Rural	179	61.7
Urban	111	38.3
Education Level		
Not read & write	26	9.0
Read & write	71	24.5
Intermediate education	136	46.9
University education	47	16.2
Post graduate	10	3.4
Mother Work		
Employee	43	14.8
Housewife	227	78.3
Worker	20	6.9
Income		
Not enough	95	32.8
Enough	159	54.8
More than enough	36	12.4
Weight (kg)		
Min. – Max.	50.0 – 110.0	
Mean ± SD.	78.73 ± 12.18	
Height (cm)		
Min. – Max.	150.0 – 188.0	
Mean ± SD.	162.42 ± 8.19	
Body Mass index (kg/m^2)		
Normal	52	17.9
Over weight	97	33.4
Obese Class I	84	29.0
Obese Class II	57	19.7
Min. – Max.	19.03 – 42.22	
Mean ± SD.	30.0 ± 5.13	

Table (2): Distribution of the studied women according to their knowledge about diet during post-partum period (n = 290)

Mother's knowledge about diet during post-partum period	Incorrect answer		Incomplete correct answer		Complete correct answer		χ^2	p
	No.	%	No.	%	No.	%		
Suitable time of diet post-partum	53	18.3	104	35.9	133	45.9	33.938	<0.001**
Food elements post-partum	0	0.0	0	0.0	290	100.0	–	–
Technique of eating post-partum	11	3.8	238	82.1	41	14.1	314.614	<0.001**
Source of information post-partum	0	0.0	0	0.0	290	100.0	–	–
The usual drink	0	0.0	40	13.8	250	86.2	152.069	<0.001**
Number of times of drinking milk	133	45.9	157	54.1	0	0.0	1.986	0.159
Type of milk usually drink	56	19.3	81	27.9	153	52.8	52.476	<0.001**
Times of eating fruits and vegetables during a normal day	1	0.3	116	40.0	173	59.7	158.821	<0.001**
Types fruits and/or vegetables (not juice) usually eat	1	0.3	15	5.2	274	94.5	488.986	<0.001**
The usual protein foods eating	0	0.0	22	7.6	268	92..4	208.676	<0.001**

χ^2: Chi square test
**highly sadistically significant at p<0.001

Table (3): Descriptive analysis of the studied mothers according to scores of knowledge about diet during post-partum period (n = 290)

Mother's knowledge about diet during post-partum period	Total score	% score
Min. – Max.	20.0 – 31.0	62.50 – 96.88
Mean ± SD.	27.15 ± 1.81	84.84 ± 5.65

Table (4): Relation between income and body mass, number of meals, constitute of meals and special diet (n=290)

Body mass index												
Income	**Normal**		**Overweight**		**Obese Class I**		**Obese Class II**		**Total**		**X^2**	**P value**
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**		
Not enough	12	4.1	26	9.0	31	10.7	26	9.0	95	32.8	15.8	0.015
Enough	37	12.8	60	20.7	39	13.4	23	7.9	159	54.8		
More than enough	3	1.0	11	3.8	14	4.8	8	2.8	36	12.4		
Number of meals												
	3 or less meals		**4 meals**		**5 meals**		**6 or more meals**		**Total**		9.13	0.17
Not enough	5	1.7	9	3.1	30	10.3	51	17.6	95	32.8		
Enough	14	4.8	27	9.3	61	21.0	57	19.7	159	54.8		
More than enough	2	0.7	4	1.4	14	4.8	16	5.5	36	12.4		
Constitute of meals												
	A meal rich in protein		**Liquids only (soup)**		**Balanced Food**				**Total**		6.78	0.148
Not enough	27	9.3	44	15.2	24	8.3			95	32.8		
Enough	47	16.2	80	27.6	32	11.0			159	54.8		
More than enough	16	5.5	10	3.4	10	3.4			36	12.4		
Special diet												
	Yes		**No**						**Total**		1.112	0.574
Not enough	12	4.1	83	28.6					95	32.8		
Enough	26	9.0	133	45.9					159	54.8		
More than enough	7	2.4	29	10.0					36	12.4		

χ^2: Chi square test
p: Statistically significant at $p \leq 0.05$

Table (5): Relation between weight before delivery and recent weight (n=290).

Weight (Kg.)	Weight groups			
	Recent		Before Delivery	
	No.	%.	No.	%
50 – 69	67	23.1	57	19.7
70 – 89	144	49.7	150	51.7
> 90	79	27.2	83	28.6
Total	290	100.0	290	100.0
Min.	50		54	
Max.	110		118	
Range	60		64	
Mean ± S.D	78.72 ± 12.18		81.81 ± 12.98	
Correlation	Value	.964	Sig.	< 0.001**
T-test results	Value	14.984	Sig.	< 0.001**
Mean of differences	3.0724			

Table (6): Distribution of the studied women according to levels of physical activity during the post-partum period (n = 290).

Physical activity during the post-partum period	Sedentary (\1.5 METs)		Light (1.5–\3.0 METs	
	No.	%	No.	%
General deferent activity	274	94.5	16	5.5
Going places for visit	290	100.0	0	0.0
Walking for fun or exercise	290	100.0	0	0.0
Activity at work	290	100.0	0	0.0
Overall physical activity	275	94.8	15	5.2

Table (7): Mean physical activity of studied women during the post-partum period (n = 290).

Physical activity during the post-partum period (min/week)	Min. – Max.	Mean ± SD.
General deferent activity	0.0 – 98.40	18.17 ± 20.35
Going places for visit	0.0 – 17.40	0.57 ± 2.49
Walking for fun or exercise	0.0 – 17.40	0.47 ± 1.81
Activity at work	0.0 – 25.80	1.29 ± 3.31
Overall physical activity	4.20 – 115.80	20.49 ± 22.47

Table (8): Correlation between mother's knowledge about diet during post-partum period with physical activity during the post-partum period (n = 290).

Physical activity during the post-partum period(min/week)	Mother's knowledge about diet during post-partum period	
	R	p
General activity	0.286	<0.001*
Going places for visit	0.078	0.183
Walking for fun or exercise	0.056	0.340
Activity at work	0.128	0.029*
Overall physical activity	0.294	<0.001*

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

Table (9): Relation between body mass index and physical activity during the post-partum period (n = 290).

Physical activity	Body mass index								Test of Sig	p
	Normal (n = 52)		Over weight (n = 97)		Obese Class I (n = 84)		Obese Class II (n = 57)			
	No.	%	No.	%	No.	%	No.	%		
General activity										
Sedentary	45	86.5	90	92.8	82	97.6	57	100.0	χ^2=	^{MC}p=
Light	7	13.5	7	7.2	2	2.4	0	0.0	10.979*	0.007*
Min. – Max.	0.0 – 94.20		0.0 – 98.40		4.20 – 94.20		0.0 – 42.60		F=2.611	0.052*
Mean ± SD.	23.87 ± 29.04		19.53 ± 22.81		15.28 ± 15.15		14.88 ± 8.88			
Going places for visit										
Sedentary	52	100.0	97	100.0	84	100.0	57	100.0	–	–
Min. – Max.	0.0 – 17.40		0.0 – 12.60		0.0 – 17.40		0.0 –17.40		F=2.518	0.058
Mean ± SD.	1.39 ± 3.85		0.30 ± 1.63		0.36 ± 2.04		0.60 ± 2.63			
Walking for fun or exercise										
Sedentary	52	100.0	97	100.0	84	100.0	57	100.0	–	–
Min. – Max.	0.0 – 12.60		0.0 – 4.20		0.0 – 8.40		0.0 – 17.40		F=2.762*	0.042*
Mean ± SD.	1.05 ± 2.61		0.17 ± 0.84		0.40 ± 1.40		0.53 ± 2.46			
Activity at work										
Sedentary	52	100.0	97	100.0	84	100.0	57	100.0	–	–
Min. – Max.	0.0 – 12.60		0.0 – 12.60		0.0 – 25.80		0.0 – 12.60		F=1.308	0.272
Mean ± SD.	1.62 ± 3.24		1.65 ± 3.12		1.11 ± 4.11		0.66 ± 2.07			
Overall physical activity										
Sedentary	45	86.5	91	93.8	82	97.6	57	100.0	χ^2=	^{MC}p=
Light	7	13.5	6	6.2	2	2.4	0	0.0	10.603*	0.007*
Min. – Max.	8.40 – 115.80		4.20 – 102.60		4.20 – 98.40		4.20 – 47.40		F=3.249*	0.022*
Mean ± SD.	27.99 ± 33.22		21.59 ± 23.53		17.15 ± 17.36		16.68 ± 10.87			

χ2: Chi square test
MC: Monte Carlo F: F for ANOVA test
*: Statistically significant at $p \leq 0.05$

Discussion

The postpartum period or puerperium is the period following childbirth during which the body tissues, specifically the pelvic organs revert back approximately to the pre-pregnant state both anatomically and physiological. It begins as soon as the placenta is expelled and lasts for approximately six weeks when the uterus regressed almost to the non-pregnant size **(WHO, 2015)**.

Healthy weight and healthy lifestyle behaviors are considered as essential prerequisites for a successful postpartum period. The importance of maternal lifestyle including nutrition in relation to the short- and long-term birth outcomes is increasingly featured in the literature. Recently, more attention has been given to excessive gestational weight gain and obesity as they are shown to significantly increase risks of complications during pregnancy and birth as well as elevating the risk of obesity in the offspring **(Soltani et al., 2020)**

The present study revealed that, near half of the studied mothers had correct knowledge of suitable time of diet post-partum, this agreed with **Hemida, (2013)**. In her study about "Utilization of postnatal care services among women in El-Behera governorate, reported that the mean mother's total knowledge postpartum care including nutrition was good. Health teaching during the postpartum period in the form of nutrition from health care providers is one of the common needs during this period.

The current study concluded that there is a highly statistically significant relationship between

financial level and body mass index, this is in agreement with

Hämmig, & Bauer, (2019) who studied Work-life imbalance and mental health among male and female employees in Switzerland. who reported factors positively associated with a higher diet quality in women were higher educational attainment, frequent vitamin/mineral supplement use, Conversely, medium income level, and were negatively associated with diet quality in women. Social customs in Egypt and cooperation between families with food in the form of gifts for women over the period, especially high energy foods lead to obesity. Social support can influence the adoption of healthy behaviors during the puerperal period

The present study reported that there was a high statistically significant correlation between weight before delivery and postpartum. these results were agreed with study by **Öhlin, & RÖssner, (2017)** conducted on the Stockholm who evaluate Pregnancy and weight development and found that Mean weight retention 1 year postpartum was 0.5 kg compared with the Pre-pregnancy body weight. Mothers who retained more than 5 kg a year after giving birth were less physically active in leisure time during the study period than mothers who gained less. There are many obstacles that women face in eating healthy food and doing adequate activities during the postpartum period, the most important of which are lack of time and lack of motivation. They also prioritize healthy eating secondary to the demands of having a child and difficulties in caring for children.

and strong social expectations of the role of a new mother.

The present study reported that four fifth of the studied women was sedentary compared to less than one fifth participated in light physical activity. This result was agreed with **Borodulin, Evenson, & Herring, (2019**) who study Physical activity patterns during pregnancy through postpartum and found that quarter (25%) of women postpartum did not report activity across intensity levels. This may be due false beliefs and misconnects about the importance of post-partum ambulation in our Arabic community. These results were similar to the results of a study conducted by **Treuth, Butte & Puyau, (2015)** about postpartum related changes in physical activity, fitness, and strength. That found two third of women reported no change in total activity. This may be due false beliefs and miss concepts about the importance of post-partum ambulation in our Arabic community On the other hand, opposite to the present results study conducted in America by **Evenson, Savitz & Huston, (2016)** who study Leisure time physical activity among pregnant women and found two third of women reporting any activity was the highest and most stable over time for any recreational physical activity. These finding different may be due to different sample, deferent setting and culture.

The current study concluded that there is a statistically significant relationship between women's knowledge of diet during the postpartum period and general physical activity. This study was

consistent with the study conducted by Osailan (2017). Who studies dietary habits and practices during the postpartum period among Saudi mothers versus American mothers, and another study conducted by Khodab and et al. (2017) on the effect of an educational program on the lifestyle of prime Para mothers during the postpartum period.: they found a positive correlation between mother's knowledge about diet during post-partum period and overall physical activity highly significant association to overweight and obese & lower physical activity. This might be due to women received good knowledge about diet during antenatal period.

Finally, it was found in this study, there appears to be a need to support clinicians, through alternate strategies such as lifestyle intervention programs targeting improved diet and physical activity behaviors amongst postpartum women **(Gilinsky et al., 2019)**.

Conclusions

This study clarified the nuances of daily foods and diets for mothers in the postpartum period from one woman to another, but there is a relationship between the postpartum period and eating habits, and there are many unhealthy patterns followed during this period. The types of physical activities that women practice during the postpartum period vary from one woman to another, but there is a lack of awareness of the importance of movement and activity and what activities and exercises are appropriate during this period.

Recommendations

1. Health education program is needed to raise awareness of primiparous women about the effect of nutritional habits on engagement in different physical activities during the postpartum period.
2. Further studies Training programs are recommended for nurses in order to enhance the knowledge and skills regarding nutrition during postpartum period in order to able to educate and counsel the primiparous women.

References

Akahasi, Y. and Tamakoshi, K. (2016). Factors associated with early postpartum maternity blues and depressiontendency among Japanese mothers with full-term healthy infants.Nagoya J. Med. Sci.2014, 76, 129–138.11.Tuteja, T.V.; Niyogi, G.M. Post-Partum psychiatric disorders.Int. J. Reprod. Contracept. Obs. Gynecol., 5, 2497–2502.

Arrish J, Yeatman H, and Williamson M. (2014). Midwives and nutrition education during pregnancy: A literature review. Women Birth.27:2–8. 5.

Bassett-Gunter R, Levy-Milne R, Naylor PJ, Symons Downs D, Benoit C, Warburton DER, (2013). Oh baby! Motivation for healthy eating during parenthood transitions: a longitudinal examination with a theory of planned behavior perspective. Int J Behav Nutr Phys Act.; 10 (1):88

Blumfield M, Hure A, Macdonald Wicks L, Patterson A, Smith R, Collins C. (2011). Disparities exist between National food group recommendations and the dietary intakes of women. BMC Women's Health; 11: 37.

Blumfield M, Hure A, Macdonald Wicks L, Smith R, Collins C. (2019). Systematic review and

metaanalysis of energy and macronutrient intakes during pregnancy in developed countries. Nutr Rev 2012; 70: 322- 336.

Boghossian, N.., Yeung, E.., Lipsky, L., Poon, A., & Albert, P. (2017). Dietary patterns in association with postpartum weight retention. The American journal of clinical nutrition, 97(6), 1338-1345.

Borodulin, K., Evenson, K., & Herring, A. (2019). Physical activity patterns during pregnancy through postpartum. BMC women's health, 9 (1), 32.

Carvalho, N., Arruda, S., Ramos, L, Machado, M.., & Azevedo, D. (2017). Dietary patterns and significance of nutrition for women with low-risk pregnancy. Revista de Nutrição, 30(2), 219-231.

Charan., J and Biswas T. (2017). How to Calculate Sample Size for Different Study Designs in Medical Research. Indian J Psychol Med; 35(2): 121–126.

Chen, L.; Wang, X.; Ding, Q.; Shan, N.; Qi, H. (2019). Development of postpartum depression in pregnant women with preeclampsia: A retrospective study. BioMed Res. Int., 1–7.

Cohen, T., Plourde, H., & Koski, K. (2019). Use of the Pregnancy Physical Activity Questionnaire (PPAQ) to identify behaviors associated with appropriate gestational weight gain during pregnancy. Journal of Physical Activity and Health, 10(7), 1000-1007.

Egypt Ministry of Health and Population; El-Zanaty and Associates; DHS Program, ICF International. (2015). Egypt Demographic and Health Survey2014.Cairo (Egypt) and Rockville (MD): Ministry of Health and Population and ICF International.

Evenson K, Savitz D, Huston S. (2016): Leisure-time physical activity among pregnant women in the US. Paediatr Perinat Epidemiol., 18 (6): 400-407.

Falciglia G, Piazza J, Ritcher E, Reinerman C, Lee S. (2020). Nutrition Education for Postpartum Women: A Pilot Study. J Prim Care Common Health. ;5(4):275–8.

Gilinsky A, Dale H, Robinson C, Hughes AR, McInnes R, Lavallee. (2017). Efficacy of physical activity interventions in post-natal populations: systematic review, meta- analysis and content coding of behavior change techniques. Health Psychol Rev. 9(2):244–63.

Haakstad LA, Voldner N, Bø K. (2017). Stages of change model for participation in physical activity during pregnancy. J Pregnancy: 1–7.

Hemida K. (2019). Utilization of postnatal care services among women in El-Behera governorate, Faculty of Nursing Alexandria University, Unpublished Master Thesis.

Herring S, Rose M, Skouteris H, Oken E. (2018). Optimizing weight gain in pregnancy to prevent obesity in women and children. Diabetes Obesity Metabol. 14:195–203.

Hiza HAB, Casavale KO, Guenther PM, Davis CA. (2018). Diet Quality of Americans Differs by Age, Sex, Race/Ethnicity, Income, and Education Level. J Acad Nut Diet. 113 (2):297–306.

Kernot J, Olds T, Lewis L, Maher C. (2021). Effectiveness of a facebook-delivered physical activity intervention for post-partum women: a randomized controlled trial protocol. BMC Public Health; 13(1):518.

Khodabandeh, F., Mirghafourvand, M.,

KamaliFard, M., Mohammad-Alizadeh-Charandabi, S., & Asghari Jafarabadi, M. (2017). Effect of educational package on lifestyle of primiparous mothers during postpartum period: a randomized controlled clinical trial. Health education research, 32(5), 399-411.

lum J, Beaudoin C, Caton-Lemos L. (2018). Physical Activity Patterns and Maternal Well-Being in Postpartum Women. Matern Child Health J.;8(3):163–9.

McGowan C, McAuliffe F. (2015). Maternal dietary patterns and associated nutrient intakes during each trimester of pregnancy. Public Health Nutr; 16: 97- 107.

Ministry of Health and Population (Egypt), ElZanaty and Associates, & ICF International. (2015). Egypt Demographic and Health Survey 2014. Cairo, Egypt and Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

Öhlin, A., & RÖssner, S. (2017). Trends in eating patterns, physical activity and socio-demographic factors in relation to postpartum body weight development. British Journal of Nutrition, 71(4), 457-470.

Osailan, N. (2017). Food Habits and Practices During the Postpartum Period Among Saudi Women Vs American Women (Doctoral dissertation, Kent State University).

Pignone MP, Ammerman A, Fernandez L, Orleans CT, Pender N, Woolf S et al. (2017). Counseling to promote a healthy diet in adults: A summary of the evidence for the U.S. Preventive Services Task Force. Am J Prev Med; 24(1):75–92.

Robaina, K., & Martin, K. (2013). Food insecurity, poor diet quality, and obesity among food pantry participants in Hartford,

CT. Journal of nutrition education and behavior, 45(2), 159-164.

Savard, C.; Lemieux, S.; Carbonneau, E.; Provencher, V.; Gagnon, C.; Robitaille, J.; Morisset, A.S. (2019). Trimester-Specific Assessment of Diet Quality in a Sample of Canadian Pregnant Women.Int. J. Environ. Res. PublicHealth,16.

Tahir, M.J.; Haapala, J.L.; Foster, L.P.; Duncan, K.M.; Teague, A.M.; Kharbanda, E.O.; McGovern, P.M.; Whitaker, K.M.; Rasmussen, K.M.; Fields, D.A.; et al. (2019). Higher Maternal Diet Quality during Pregnancy and Lactation Is Associated with Lower Infant Weight-For-Length, Body Fat Percent, and Fat Mass in Early Postnatal Life.Nutrients, 11.

Tawfik AA, Hanna ET, Abdel-Maksoud AM. Anemia and iron deficiency anemia in Egypt. (2015). IOSR J Pharm; 5 (4):30-4

Treuth M, Butte N, Puyau M. (2015). Pregnancy-related changes in physical activity, fitness, and strength. Med Sci Sports Exerc. 37 (5): 832-837.

Van der Pligt, P., Olander, E. K., Ball, K., Crawford, D., Hesketh, K. D., Teychenne, M., & Campbell, K. (2016). Maternal dietary intake and physical activity habits during the postpartum period: associations with clinician advice in a sample of Australian first-time mothers. BMC pregnancy and childbirth, 16(1), 27.

Weiss, M.., & Lokken, L. (2019). Predictors and outcomes of postpartum mothers' perceptions of readiness for discharge after birth. Journal of Obstetric, Gynecologic & Neonatal Nursing, 38(4), 406-417.

Wennberg, A.L.; Isaksson, U.; Sandstrom, H.; Lundqvist, A.;

Hornell, A.; Hamberg, K. (2016). Swedish women's food habits during pregnancy up to six months post-partum: A longitudinal study. Sex. Reprod. Healthc.2016,8, 31–36.

Wilkinson SA, van der Pligt P, Gibbons KS, McIntyre HD.(2017). Trial for Reducing Weight Retention in New Mums: a randomised controlled trial evaluating a low intensity, postpartum weight management programme. Journal of Human Nutrition and Dietetics .

Wiltheiss G, Lovelady C, West D, Brouwer R, Krause K, Ostbye T.(2015) .Diet Quality and Weight Change among Overweight and Obese Postpartum Women Enrolled in a Behavioral Intervention Program. J Acad Nut Diet.; 113(1):54–62.

World Health Organization, & UNICEF. (2015). Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice.

Xiang, M., Konishi, M., Hu, H., Takahashi, M., Fan, W., Nishimaki, M., & Sakamoto, S. (2016). Reliability and validity of a Chinese-translated version of a pregnancy physical activity questionnaire. Maternal and child health journal, 20(9), 1940-1947.