Pregnancy Intention and Its Effect on Antenatal Care Service Utilization, Postpartum Infant Bonding, and Postpartum Depression

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Abstract

Background: Unplanned conception resulting in a live delivery can have serious health, psychosocial, and economic consequences; and increases the likelihood of bonding failure and postpartum depression. **Aim:** This study aimed to assess the effect of pregnancy intention on antenatal care service utilization, postpartum infant bonding, and postpartum depression. **Design:** A cross-sectional, analytical study design was utilized on 213 women who were attending breast feeding clinic, and outpatient clinic in Obstetrics and Gynecology Hospital - It is affiliated to Ain Shams University Hospitals. **Tools of data collection:** The data was collected using 1) Mother's interviewing questionnaire that included a) Mother's demographic characteristics, and b) obstetric history; 2) London Measure of Unplanned Pregnancy; 3) Postpartum Bonding Questionnaire; and 4) Edinburg postnatal depression scale. **Results**: data analysis revealed that, (72.8%) of the studied women had unintended pregnancy as (32.4%) of them had unplanned pregnancy, and (40.4%) of them had ambivalent pregnancy, while (27.2%) of them had planned pregnancy. Also (59.2%) of the studied women had postpartum depressive symptoms (EPD Score ≥13). Also, (61.9%) of the studied women had postpartum infant bonding disorder. There was a highly statistically significant relation between pregnancy intention and antenatal care service utilization, also there were statistically significant moderate negative correlations between pregnancy intention, and postpartum depression and two domains of postpartum infant bonding which are infant focused anxiety domain and rejection and pathologic anger domain. **Conclusion:** This study concluded that, women with unintended pregnancy experienced lack of antenatal care service utilization, postpartum depression, infant focused anxiety, and pathologic anger compared to women with intended pregnancy. **Recommendation:** 1. Prevention of unintended pregnancy through increasing women awareness regarding family planning camps affiliated to ministry of health and population. 2. Establishing psychosocial counseling clinic to offer psychological support services for couples who are at risk for psychological problems.

Key words: Antenatal Care Service Utilization- Maternal Depression - Postpartum Infant Bonding- Pregnancy Intention.

Introduction

Pregnancy intention is an important concept in reproductive health research and practice. It is a significant determinant of both short- and long-term maternal and child physical and mental health outcomes as well as it plays a vital role on maternal health service utilization, including the late commencement of antenatal care service and early initiation of breast feeding **(Metwally, Saleh,**

Abdelhamed, Salama, Mores, Shaaban, & Azmy, 2015).

Intended pregnancy occurs with the willingness of couples, and is desired at the time of conception, while unintended pregnancy is unwanted and unplanned at the time of conception and is further classified as mistimed as in case of woman conceived sooner than she had planned; and unwanted pregnancy as in case of women who already have children and do not want any more children **(Dhakal, Sung Song, Eun Shin, Ho Lee, Young So, & Woo Nam, 2016).**

It is worth mentioning that unintended pregnancy is a public health concern both in developed and developing countries as it affects not only women, but it affects their babies, families, and society, as well **(World Health Organization, 2015).** These include negative health outcomes, poor prenatal care, high-risk pregnancy behaviors, poor mental and psychosocial outcomes, increased rates of preterm birth and low birthweight, poor social outcomes in childhood and increased medical costs **(Stern, Salih Joelsson, Tydén, Berglund, Ekstrand, Hegaard, & Kristiansson, 2016).** Accordingly, every married woman is at risk of the problem of unintended pregnancy, and although many such pregnancies end in abortion, about 58% result in a live birth **(Mercier, Garrett, Thorp, & Siega-Riz, 2013).**

World Health Organization (WHO) recommends that adequate antenatal care for a normal pregnancy that has no complications should comprise four Antenatal care (ANC) **(World Health Organization, 2016).** Early enrollment in ANC is a widely accepted and recommended behavior for pregnant women to improve pregnancy outcome,

facilitates the timely management and treatment of pregnancy complications to reduce maternal deaths, while late enrollment is viewed as a behavior that places women at increased risk of poor pregnancy outcome **(Amo-Adjei & Anamaale Tuoyire, 2016).**

Consequently, unintended pregnancies result in unhealthy behaviors or continue unhealthy behaviors during pregnancy. Thus, unintended pregnancy has direct relation with poor utilization of maternal health care services during pregnancy like delayed initiation of, or low attendance at antenatal care visits **(Dibaba, Fantahun, & Hindin, 2013; Abajobir Maravilla, Alati, & Najman, 2016; and Gulema & Berhane, 2017).**

The term "bonding" describes the unique psychological and emotional tie between the mother and her infant and is characterized by positive feelings, emotional warmth, and affection towards the baby **(Tietz, Zietlow, & Reck, 2014; and Garcia-Esteve, Torres, Lasheras, Palacios-Hernández, Farré-Sender, Subirà, & Brockington, 2016).**

The emotional bonding motivates mothers to acquire motherhood competence and satisfaction for this role after childbirth as prenatal bonding predicts the early mother-infant relationship. Increased attachment makes mothers more interested in healthy behaviors such as proper nutrition, utilization of maternal health care services, and participation in childbirth education classes **(Sanga, Mola, Wattimena, Justesen, & Black, 2014; and Hee & Young, 2015).** Postnatally**,** mothers with a higher quality of prenatal maternal bonding are more sensitive and more stimulating in interaction with their babies, increasing tendency to breast-feeding, and promoting mothers'

confidence in playing maternal role **(Rossen, Hutchinson, Wilson, Burns, Olsson, Allsop, & Mattick, 2016).**

Bonding disorder has been acknowledged as an important problem in perinatal psychiatry. However, it has not been recognized as a nosological category either in the ICD-10 or the DSM-IV. Impaired maternal bonding has been associated with a number of maternal risk factors including unintended pregnancy, as mothers who has negative feelings towards pregnancy have unwelcoming or ambivalent feelings towards their fetus **(Ohoka, Koide, Goto, Murase, Kanai, Masuda, & Ozaki, 2014).** Moreover, women with unintended pregnancies are more likely to have less support from their husband which impact their mental health and result in bonding failure (**Nakano, Upadhyaya, Chudal, Skokauskas, Luntamo, Sourander, & Kaneko, 2019)**.

Furthermore, impaired maternal bonding can result in a higher risk of abusive parenting, poor mother-infant interaction, high levels of maternal anxiety and depression that can lead to adverse pregnancy outcome (**Kordi, Fasanghari, Asgharipour, & Esmaily, 2016; and Nakano, et al., 2019).**

Hence, an unintended pregnancy increases the risk for poor maternal mental health including perinatal depression, maternal postpartum depression, stress, and lower levels of psychological well-being and life satisfaction **(Mercier, et al., 2013; and Upadhyay & Srivastava, 2016).**

Depression in the postpartum period is a well-known health-care problem and a serious economic burden. For a significant proportion of women, postpartum depression (PPD) is the first mood episode in their lives, yet it still often goes unrecognized or is diagnosed late **(Prelog, Šimic, Sršen, & Makovec, 2019).** Additionally, postpartum depression can have somatic manifestations such as headache, fatigue, decrease appetite, insomnia, and lack of energy. Depressive symptoms during the postpartum period have serious implications for both the mother's and child's health **(Dennis, Falah-Hassani, & Shiri, 2017).**

predictive factors for PPD include a negative birth experience, the mode of delivery (especially Caesarian section), unintended/unplanned pregnancy, lower age and less social support during pregnancy **(Prelog, et al., 2019).**

Those women can experience intense irritability and anger, anxiety, feelings of guilt, and a sense of being unable to care for the baby. Postpartum depression is also associated with disturbances in mother-infant bonding and the child's emotional and cognitive development. Several international studies have demonstrated an increased risk for postpartum depression after an unintended pregnancy **(Suh, Ma, Dunaway, & Theall, 2016).**

Postpartum depression has been associated with a decrease in the time a mother spends with her infant, missed pediatric appointments, higher levels of disruptive behavior among children, and insecure attachment between mother and child **(Barton, Redshaw, Quigley, & Carson, 2017).**

A meta-analysis suggested that maternal depression often coexists with bonding failure **(Ohara, Okada, Kubota, Nakamura, Shiino, Aleksic, & Ozaki, 2017).**

Significance of the study:

The issue of unplanned pregnancy in Arabic-speaking countries within the Middle East and North Africa (MENA) has rarely been investigated, partly due to the challenges in defining and measuring unplanned pregnancy. Results from household surveys including the Pan Arab Project for Family Health (PAPFAM) and the Demographic and Health Survey (DHS) in six countries (Algeria, Lebanon, Morocco, Palestine, Syria, and Yemen) indicated that these countries have 1.2 million unintended births **(Almaghaslah, Rochat, & Farhat, 2017).**

The unintended pregnancies prevalence was 40% in 2012 with the largest proportion occurred in Africa **(Sedgh, Singh, & Hussain, 2014).** Over the past decade, unintended pregnancy prevalence rate ranged from 15 to 58% of pregnancies in the countries of North Africa and the Middle East. Its prevalence rate was estimated as 58% in Yemen, 38% in Palestine, 32% in Morocco, and 31% in Syria and Algeria. In Egypt, it was estimated to be 23% **(Youssef, Osman, & Roudi-Fahimi, 2014).**

The Egyptian Demography Health Survey (EDHS), 2014, showed that, overall, 16% of births in the 5-year period were not wanted at the time of conception (i.e., including the mistimed and unwanted) **(Mohamed, Hamed, Yousef, & Ahmed, 2019; and El-Zanaty, 2015).**

As mentioned, the disruption to life caused by an unplanned conception carried to live delivery may increase likelihood of bonding failure and postpartum depression. Additionally, unintended pregnancies and unplanned births can have serious health, psychosocial and economic consequences for women, their babies, and families **(Barton, et al., 2017).**

Postpartum depression prevalence was 13-40%. Women from developing countries reported higher PPD levels as opposed to women from developed countries. There were few studies in Arab countries on the prevalence of PPD. The prevalence of PPD in Lebanon is 21%, United Arab Emirates (UAE) 22%, Tunisia 19.2%, Jordan 22%, and 37.1% in Bahrain **(Al Hinai, & Al Hinai, 2014).**

However, little has been reported on the relationship between maternal depression and bonding failure during pregnancy and after delivery, despite its significance in research and clinical settings **(Ohara, et al., 2017).**

Aim of the study:

The aim of this study was to assess the effect of pregnancy intention on antenatal care service utilization, postpartum infant bonding, and maternal depression.

Research question

What is the effect of pregnancy intention on antenatal care service utilization, postpartum infant bonding, and postpartum depression?

Subject and Methods

Research design:

A descriptive cross-sectional, analytical design was used to examine the relationships among pregnancy intention, and antenatal care service use, postpartum infant bonding, and maternal depression.

Study setting

This study was conducted at breast feeding clinic, and outpatient clinic in Obstetrics and Gynecology Hospital - It is affiliated to Ain Shams University Hospitals.

Subjects:

A purposive sample of 213 women according to certain inclusion criteria, who were available at the time of data collection, and determined by using appropriate statistical equation.

$$S = X\ ^2NP\ (1-P) \div d\ ^2\ (N-1) + X\ ^2P\ (1-P).$$

s= required sample size

x=the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N=the population size.

P=the population proportion (assumed to be .50 since this would provide the maximum sample size)

d=the degree of accuracy expressed as a proportion (.05) (**Krejcie, & Morgan, 1970**).

Inclusion criteria:

• Within 6 months after delivery (as after six months the babies finished their exclusive breast feeding).

Exclusion criteria:

• Women who have:

☐ chronic medical diseases.

☐ physical disabilities.

☐ diagnosed with psychiatric disorders.

☐ born a baby with handicap.

☐ born twins (which consider an extra burden compared to single pregnancy).

☐ risk pregnancy.

☐ postpartum complications.

• Women whose baby was admitted at NICU immediately after delivery.

Tools of data collection

Data were collected by using the following tools:

I)Mothers` interviewing questionnaire that includes:
a) Mother's demographic characteristics: as age, educational level, occupational status, adequacy of monthly income,
b) Obstetric history: it includes antenatal care visits, parity, type of delivery, and the baby`s gender.

II) The London Measure of Unplanned Pregnancy (LMUP) is a psychometrically validated measure of the degree of intention/planning of a current or recent pregnancy. LMUP comprises 6 questions, each scored at 3-point Likert 0, 1, or 2. These are summed to create an ordinal variable on a scale of 0–12, with each increase in score reflecting an increase in pregnancy intention (**Hall, Barrett, Copas, & Stephenson, 2017**).

Scoring:

0–3	Unplanned	Unintended
4–9	Ambivalent	
10–12	Planned	Intended

III) Postpartum Bonding Questionnaire (PBQ) Brockington, Oates, George, Turner, Vostanis, Sullivan, & Murdoch (2001) is a self-administered tool designed for early detection of disturbances in mother–infant bonding and comprises 25 questions rated on a 6-point Likert-type scale (0–5). each followed by six alternative responses ranging from 'always' to 'never'. Positive responses, such as ''I enjoy playing with my baby'', are scored from zero ('always') to 5 ('never'). Negative responses, such as ''I am afraid of my baby'', are reverse scored from 5 ('always') to zero ('never'). It has four clinical relevance factors that are used to define four scales: scale 1 (impaired bonding), scale 2 (rejection and anger), scale 3 (Infant focused anxiety), and scale 4 (incipient abuse). The total score ranges from 0 to 125, with a proposed minimum cutoff value of 26 indicating the presence of any type of bonding disorder **(Busonera, Cataudella, Lampis, Tommasi, & Zavattini, 2017).**

Scoring:

Scales	Scoring	Cutoff point
Impaired bonding (12-statements)	0:60	12=high
Rejection and anger (7-statements)	0:35	13=high
Infant focused anxiety (4-statements)	0:20	10=high

Incipient abuse (2-statements)	0:10	3=high

IV) Edinburg postnatal depression scale (EPDS) **(Cox, Holden, & Sagovsky, 1987).** The Edinburgh Postnatal Depression Scale (EPDS) was developed to assist health professionals in detecting mothers suffering from Postpartum Depression; a distressing disorder more prolonged than the "blues" (which can occur in the first week after delivery). The scale consists of 10 short statements. A mother checks off one of four possible answers that is closest to how she has felt during the past week. Most mothers easily complete the scale in less than five minutes. Based on the seriousness of the symptom, responses are scored 0, 1, 2 and 3. Items 3, 5 to 10 are reverse scored. The total score is found by adding together the scores for each of the 10 items. Mothers scoring above 13 are likely to be suffering from depression and should seek medical attention. A careful clinical evaluation by a health care professional is needed to confirm a diagnosis and establish a treatment plan **(Badr, Ayvazian, Lameh, & Charafeddine, 2018).**

Scoring

Scales	Scoring	Cutoff point
EPDS (10-statements)	0:30	13= postpartum depression

Operational Design

The operational design for this study includes preparatory phase, pilot study, field work, limitations of the study, and ethical considerations.

Preparatory phase:

It included reviewing past, current, local, and international related literature, and theoretical knowledge of various aspects of pregnancy intention, factors affecting antenatal care service use, postpartum infant bonding, and maternal postpartum depression using books, articles, internet, periodicals, and journals.

The selected tools were translated into Arabic language and back translated into English language by language experts, and any discrepancies elicited between the back translation and the original tools were taken as an indication of translation error.

Tool validity and reliability:

It was ascertained by experts from Psychiatric/Mental Health Nursing, Maternity Nursing and Community Health Nursing, their opinions were elicited as regards to the tool format layout, and knowledge accuracy and relevance between translated and original copies,

Internal consistency (Cronbach alpha) and Pearson correlation coefficient (r) were tested for each tool.

Tool	Reliability "Pearson's r"	Cronbach's coefficient
LMUP	0.82	0.78
PBQ	0.93	0.89
EPDS	0.81	0. 85

Pilot study:

The pilot study was conducted on a ratio of 10 % of the study sample size "22 cases" to evaluate the clarity, applicability, and feasibility of the research tools and to estimate the time needed for data collection. There was no modification needed based on the results of the pilot.

Field work:

The study consumed four months during the period from the beginning of July to the end of October 2019.

Before starting the data collection, the nature and the purpose of the study were explained to:

1.Medical director of outpatient and breast-feeding clinics to get an official permission.

2.The head nurse and nursing staff in outpatient and breast-feeding clinics separately to get their cooperation.

Data were collected through six days/week during morning shift (9.00 a.m.: 2.00 p.m.) for 20 minutes for each case. Confidentiality of any obtained information was assured, and the subjects were informed about their right to participate or not in the study. The participants were also assured about anonymity, and that data will only be used for the purpose of the study.

The researchers met with each woman individually and introduced themselves; explained the purpose and nature of the study; and ensured the confidentiality of data. women were asked if they were interested and agreed to participate in the study. After that, the researchers interviewed the mothers individually.

Administrative Design

An official letter was issued from the Faculty of Nursing-Ain Shams University to the director of Obstetric and Gynecological Hospital, explaining the

aim of the study and requesting their permission for data collection. Oral consent was obtained from every participant who shared the study.

Ethical considerations

Participation was voluntary and anonymity was assured. Approval of hospital director and in nurses was taken first also suitable time for data collection was determined with each woman and consent was taken from each participant. The participants were informed their right to withdraw from the study at any time. Participants were assured about confidentiality of the information gathered and its use only for their benefits and for the purpose of the study.

Statistical Design

In the present study, a frequency analysis, using SPSS 20. The collected data were organized, categorized, tabulated, and analyzed. Data were presented in tables and figure using actual numbers and percentage of tables. The statistical significance and association were assessed using Mean and stander deviation, qui square, Anova, and Pearson correlation coefficient. The observed differences, associations were considered as follows: P > 0.05 not significant (NS); P < 0.05 significant (S); and P < 0.001 high significant (HS).

Results

Regarding distribution of the studied women according to their demographic characteristics and pregnancy data, **table (1)** reveals that,

40.9% of the studied women were at age group 25-30 years old with mean age 26.94±4.63 years old, regarding educational status of them, 45.1% of them had diploma. Regarding occupational status, 50.2% were housewives. and 61.9% of them their monthly income was enough for basic needs.

Table (2) shows that, As regards parity of the studied women, 40.4% of them were para 2, regarding the utilization of antenatal care service during pregnancy, 62.9% of them had irregular antenatal visits, and 59.2%, and 58.2% of them had cesarean delivery, and delivered baby girl, respectively.

Figure (1): illustrates pregnancy intention and shows that 72.8% of the studied women had unintended pregnancy as (32.4%) of them had unplanned pregnancy, and (40.4%) of them had ambivalent pregnancy, while (27.2%) of them had intended (planned) pregnancy.

Figure (2): reveals that (59.2%) of the studied women had postpartum depression (EPD Score ≥13), while (40.8%) of them their EPD Scores were <13. Also, the majority of women with unplanned pregnancy had postpartum depression.

Figure (3): illustrates that, (36.2%) of the studied women had impaired ponding (cutoff point =12), none of them (0%) had incipient abuse (cutoff point =3). While (61%) of them had rejection and pathologic anger (cutoff point =13, and (69%) of them had infant focused anxiety (cutoff point =10).

Figure (4): illustrates that, (61.9%) of the studied women had postpartum infant bonding disorder.

Regarding the relation between the studied women`s pregnancy intention, and their utilization of antenatal care service **Table (3)**: shows that, there was a highly statistically significant relation between women`s pregnancy intention and antenatal care service utilization, in which x^2 =42.99 at p= 0.000. As women with planned pregnancy used antenatal care service more regularly than other groups.

Regarding the relation between pregnancy intention and postpartum depression, and postpartum infant bonding domains among the studied women, **table (4)** shows that, women with unplanned pregnancy experienced postpartum depression, infant focused anxiety, and rejection and pathologic anger compared to other groups, as there were statistically significant relations between pregnancy intention and women`s mean scores in postpartum depression, infant focused anxiety, and rejection and pathologic anger in which f= 23.628, 15.388, and 0.651at p=.000, .000, and 0.023 respectively.

Table (5): shows that, there were significant moderate negative correlations between pregnancy intention, and postpartum depression and two domains of postpartum infant bonding which are infant focused anxiety domain and rejection and pathologic anger domain in which r= -0.420, -0.392, and -0.426 at p= 0.000, 0.000, and 0.005 respectively. Also, there was a very high positive correlation between women`s postpartum depression and rejection and pathologic anger domain which r=.975 at p=0.002, and a moderate positive correlation between women`s postpartum depression and infant focused anxiety domain which r=.470 at p= 0.000.

Table 1: Distribution of the studied women according to their demographic characteristics (n=213).

Statement	Intended (no.58) Planned No. (%)	Unintended (no.155) Ambivalent No. (%)	Unplanned No. (%)	No.	%
Age					
18 < 25	26 (12.2)	16 (7.5)	0 (0)	42	19.7
25 < 30	23 (10.8)	38 (17.8)	26 (12.2)	87	40.9
30 ≤ 35	9 (4.2)	11 (5.2)	26 (12.2)	46	21.6
> 35	0 (0)	21 (9.9)	17 (7.9)	38	17.8
Mean ±SD	26.94±4.63				
Educational Status					
Illiterate	3 (1.4)	11 (5.2)	5 (2.3)	19	8.9
Basic education	3 (1.4)	5 (2.3)	1 (0.5)	9	4.2
Diploma	32 (15)	43 (20.2)	21 (9.9)	96	45.1
Higher education	20 (9.4)	27 (12.7)	42 (19.7)	89	41.8
Occupational Status					
Housewife	25 (11.7)	37 (17.4)	45 (21.1)	107	50.2
Governmental work	14 (6.6)	7 (3.3)	21 (9.9)	42	19.7
Private work	19 (8.9)	42 (19.7)	3 (1.4)	64	30.1
Adequacy of monthly income "according to participant`s point of view"					
Enough for basic needs	17 (8)	65 (30.5)	50 (23.5)	132	61.9
Not enough for basic needs	0 (0)	3 (1.4)	8 (3.8)	11	5.2
More than basic needs	41 (19.2)	18 (8.5)	11 (5.2)	70	32.9

Table 2: Distribution of the studied women according to their pregnancy data (n=213).

Statement	Intended (no.58) Planned No. (%)	Unintended (no.155) Ambivalent No. (%)	Unplanned No. (%)	No.	%
Parity					
P1	32 (15)	7 (3.3)	1 (0.5)	40	18.7
P2	24 (11.3)	61 (28.6)	3 (1.4)	86	40.4
P3	2 (0.9)	15 (7.1)	37 (17.4)	54	25.4
P4 o more	0 (0)	3 (1.4)	28 (13.1)	33	15.5
Antenatal care visit					
Regular	40 (18.7)	20 (9.4)	19 (8.9)	79	37.1
Irregular	18 (8.5)	66 (31)	50 (23.5)	134	62.9
Type of delivery					
Normal	28 (13.1)	41 (19.2)	18 (8.5)	87	40.8
Cesarean section	30 (14.1)	45 (21.1)	51 (23.9)	126	59.2
Baby`s gender					
Boy	27 (12.7)	46 (21.6)	16 (7.5)	89	41.8
Girl	31 (14.5)	40 (18.7)	53 (24.9)	124	58.2
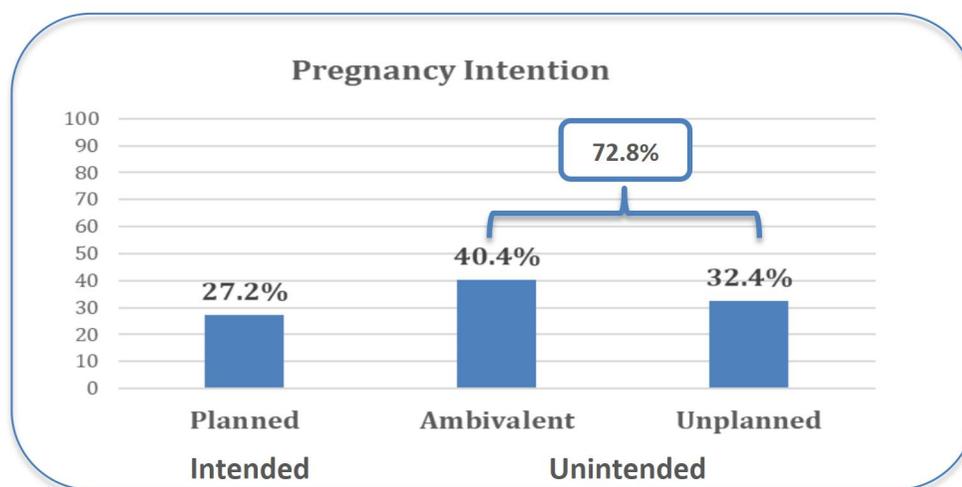
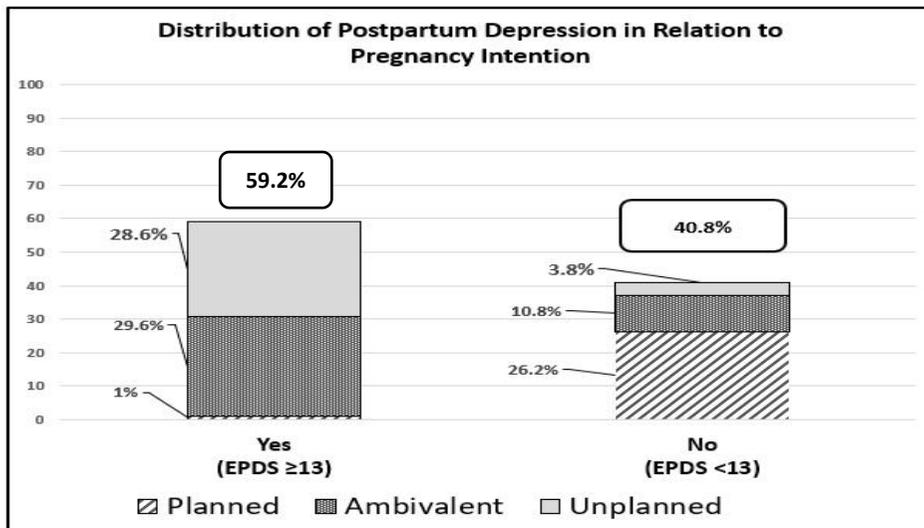**Figure (1): Distribution of the studied women according to pregnancy intention (n=213).**

Figure (2): Distribution of the studied women according to their levels of postnatal depression and pregnancy intention status (n=213).
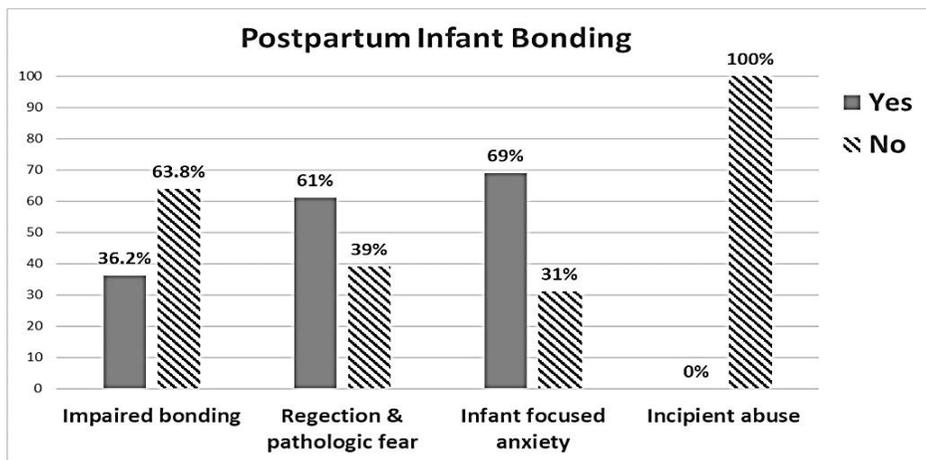

Figure (3): Distribution of the studied women according to postpartum infant bonding domains (n=213).
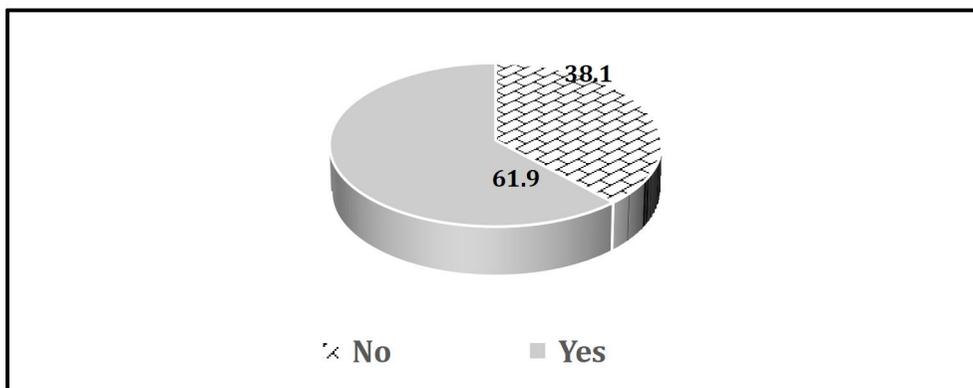
Figure (4): Distribution of the studied women according to their total score of postpartum infant bonding (n=213).

Table 3: Relation between the studied women`s pregnancy intention, and their utilization of antenatal care service (n=213).

Pregnancy intention		Antenatal visit Irregular (%)	Regular (%)	X^2	P value
Unintended	Unplanned	54.4%	8.9		
	Ambivalent	30.9	9.5	42.99	0.00**
Intended	Planned	8.5	18.7		

(*) statistically significant at p< 0.05.   (*) highly statistically significant at p< 0.001.

Table 4: Relation between pregnancy intention and postpartum depression, and postpartum infant bonding domains (incipient abuse, infant focused anxiety, Rejection and pathologic anger, and Impaired ponding) among the studied women (n=213).

Variables	Unintended				Intended		f test	p value
	Unplanned		Ambivalent		Planned			
	Mean	SD	Mean	SD	Mean	SD		
Postpartum depression	15.80	5.163	14.04	4.490	10.19	4.711	23.628	.000**
Incipient abuse	1.83	.785	1.90	.770	1.78	.702	.425	.654
Infant focused anxiety	11.26	2.999	10.32	2.888	8.55	2.663	15.388	.000**
Rejection and pathologic anger	17.56	3.996	13.68	3.844	15.53	20.038	.651	.023*
Impaired ponding	11.91	3.648	11.59	3.457	10.88	3.003	1.583	.208

(*) statistically significant at p< 0.05.   (*) highly statistically significant at p< 0.001.

Table 5: Correlation between pregnancy intention, and postpartum depression and postpartum infant bonding domains (incipient abuse, infant focused anxiety, rejection and pathologic anger, and impaired ponding) among the studied women (n=213).

Variables	Pregnancy intention		Postpartum Depression	
	r	p value	r	p value
Pregnancy intention			-.420**	.000
Postpartum depression	-.420**	.000		
incipient abuse	-.020	.772	.097	.159
infant focused anxiety	-.392**	.000	.470**	.000
Rejection and pathologic anger	-.426**	.005	.975**	.002
Impaired ponding	-.082	.236	.014	.842

(*) statistically significant at p< 0.05.   (*) highly statistically significant at p< 0.001.

Discussion

The present study was designed to assess the effect of pregnancy intention on the antenatal care service utilization, postpartum infant bonding, and postpartum depression

Data analysis of the current study revealed that, one third of the studied women had unplanned pregnancy. This could be due to misuse of contraceptive methods and limited access to reproductive health services including family planning camps.

This is supported with **Mohamed, et al., (2019),** who studied the prevalence, determinants, and outcomes of unintended pregnancy in Sohag district, Egypt, and mentioned that the prevalence of unintended pregnancy in Sohag district in 2016 was about one third.

This is also in line with **Isumi, & Fujiwara, (2017)**, who mentioned that, of all participants, about one quarter of them reported unintended pregnancy.

This result is near to the finding of **Sedgh, et al., 2014,** who stated that unintended pregnancies prevalence was two fifths in 2012 with the largest proportion occurred in Africa.

Also, the prevalence in the current study is close to other Islamic countries, as the prevalence of unintended pregnancy in Iran is about one third **(Moosazadeh, Nekoei-moghadam, Emrani, & Amiresmaili, 2014).**

This finding is contradicted with Egyptian Demography Health Survey (EDHS), 2014, that revealed, 16% of births in the 5-year period were not wanted at the time of conception (i.e., including the mistimed and unwanted) **(El-Zanaty, 2015).** The difference could be attributed to the different socioeconomic factors and use of contraceptive methods.

Prevalence of unintended pregnancy differs from one community to another. In Egypt, it is much less than that of the USA which is about 45% **(Finer & Zolna, 2016),** in which the prevalence of adolescent pregnancy is high and pregnancy in unmarried women which is rare in our community.

Pregnancy intention & antenatal care services utilization

This study showed that there was a highly statistically significant relation between women`s pregnancy intention and antenatal care service utilization, as more than half of the studied women (ambivalent and unplanned) had unintended pregnancy and utilized antenatal care services irregularly.

This might be explained by maternal attitude and behavior; her feelings about having an unwanted pregnancy might contribute to conscious or unconscious neglect of her own health care. Another explanation could be that women with unplanned pregnancy might get less familial or husbands support (in terms of economic or emotional) for her good health care during pregnancy. Women might also be emotionally and financially less prepared for an unwanted pregnancy and childbearing, resulting in less care for themselves and for the developing unwanted fetus during pregnancy.

This finding corroborates the findings of **Tekelab, & Berhanu, (2014); and Bahk, Yun, Kim, & Khang, (2015),** who mentioned that others who have unintended pregnancies are less likely to initiate and utilize prenatal and antenatal care and, on average, seek it later than mothers whose pregnancies are intended

This result is contradicted with **Rahman, Rahman, Tareque, Ferdos, & Jesmin, (2016),** who mentioned that there is no association between mistimed pregnancy and utilization of antenatal care, they rationalized this finding as the feelings of women with ambivalence pregnancy may not be as disturbed by their pregnancy compared with an unwanted pregnancy.

Pregnancy intention & postpartum depression

Data analysis of the current study showed that there was a highly statistically significant relation between pregnancy intention and women`s mean score in postpartum depression, also, there was a significant moderate negative correlation between pregnancy intention and postpartum depression. This is supported with the current study findings as about three fifths of the studied women had postpartum depression (EPD Score ≥ 13), and it is obviously from data analysis that the majority of women with unintended pregnancy (ambivalent and unplanned pregnancy) had postpartum depression (EPD Score ≥ 13) compared to other women with planned pregnancy who scored <13 on EPD

There are several possible explanations for these results, as the conditions of those women may be not ideal for having a child, either because of economic concerns as three quarters of the studied women who had unintended pregnancy their monthly income was enough for basic needs only; half of them were para 3, or because half of them their age was above 30 years old. Also, those women may receive discordance from their husbands as they do not want the pregnancy or not ready for it, which reflect conflict in the relationship and poorer relationship quality, that lead to increase the risk of poor maternal mental health as depression, especially with the demands and responsibilities of the new babies.

These finding come in line with the results of **Hall, Kusunoki, Gatny, & Barber, (2014),** who investigated the risk of unintended pregnancy among young women with mental health symptoms and mentioned that maternal mental health

problems have been purported as both causes and consequences of unintended pregnancies. As stress is suggested to increase the risk of poor maternal mental health by reducing coping skills in mothers with unintended pregnancies.

These also come in accordance with the findings of **Ikamari, Izugbara, & Ochako, (2013); McCrory and McNally, (2013); and Yanikkerem, Ay, & Piro, (2013),** who revealed that unintended pregnancies assessed through retrospective reports were found to be associated with maternal perinatal mental health including varying degrees of depressive disorders, as well as findings from some prospective studies suggest prenatal and postpartum depression, and other mood disorders in women.

The present findings seem to be consistent with **Suh et al., (2016); and Surkan, Strobino, Mehra, Shamim, Rashid, Wu, & Christian (2018),** as the researchers found that compared to mothers who wanted their pregnancies, those who mistimed or did not want to conceive, would have higher rates of reported postpartum depressive affect, with stronger associations in unwanted pregnancies than mistimed pregnancies. Also, they revealed that mothers whose partners viewed the pregnancy as mistimed or unwanted would have higher rates of reported postpartum depressive affect than mothers whose partners wanted the pregnancy.

These results agree with other study by **Abajobir, et al., (2016),** who conducted a systematic review and meta-analysis of the association between unintended pregnancy and perinatal depression and mentioned that depression was higher in women who reported an unintended pregnancy. The findings also point to substantial significant overall and subsample associations of intendedness and maternal depression. Sub-group analysis suggests that unintended pregnancy is associated with maternal depression particularly during the postpartum period. Mistimed pregnancy and/or child-birth had slightly lower association with depression than does an unwanted pregnancy.

These also supported with **Bahk, et al., (2015),** who showed that an absence of intention for a pregnancy had an adverse effect on maternal depression and parenting stress, and that the relation between pregnancy intention and maternal mental health was partly mediated by marital conflict, fathers' participation in childcare, and mothers' knowledge of infant development.

However, these results disagree with other longitudinal studies of **Mercier, et al., (2013); Kerstis, Aarts, Tillman, Persson, Engström, Edlund, Öhrvik, Sylvén, & Skalkidou, (2016); Farré-Sender, Torres, Gelabert, Andrés, Roca, Lasheras, & Garcia-Esteve, (2018), and Prelog, et al., (2019),** who reported statistically nonsignificant associations between unintended pregnancies and postpartum depression.

Pregnancy intention & postpartum infant bonding

Another important finding in the current study was that there were significant moderate negative correlations between pregnancy intention and two domains of postpartum infant bonding which are infant focused anxiety domain and rejection and pathologic anger domain. These results may be due to some contributing factors as about two thirds of women with unintended pregnancy had cesarian section delivery and the majority of them had postpartum

depression (EPD Score ≥13), as the result of current study revealed a very high positive correlation between women`s postpartum depression and rejection and pathologic anger domain and a moderate positive correlation between women`s postpartum depression and infant focused anxiety domain. Since depression is linked to symptoms such as dysphoria, rumination, sleep problems and fatigue, adding to this the demands of the newborn. All these factors are considered a burden especially if they were experiencing lack of social or spousal support.

The present findings are consistent with **Pakseresht, Rasekh, & Leili, (2018),** who studied "Physical Health and Maternal-Fetal Attachment among Women: Planned Versus Unplanned Pregnancy" and found that that type of pregnancy can be a predictor of attachment, and the attachment score in the women with unplanned pregnancies was significantly less than that in the women with planned ones.

These results match those observed in previous studies conducted by **Aflakseir, & Jamali, (2014); Galeshi, Mirghafourvand, Alizadeh-Sharajabad, & Sanaati, (2016); and Borji, Shahbazi, Nariman, Otaghi, & Safari, (2018),** in which mother-child bonding disorders increased with the rise of depression in mothers.

Similarly, **Ossa, Bustos, & Fernandez (2012),** reported that three fifths of the women with unplanned pregnancies had significantly less maternal-fetal attachment. **Ustunsoz, Guvenc, Akyuz, & Oflaz (2010),** also concluded that the attachment score in the planned pregnancy was more than that in the other type which was in line with the present study.

While **Torshizi & Sharifzadeh, (2013); and Abazari, Pouraboli, Tavakoli, Aflatoonian, & Kohan, (2017),** found that the mean score of maternal-fetal attachment had no significant difference in planned versus unplanned pregnancies this difference may be due to the differences in sample size and cultural and social characteristics of the research population.

Also, the results of the current study are contradicted with the study carried out by **Badr et al., (2018),** who found that scores on the EPDS were not associated with mother infant bonding.

Several explanations are possible, it could be that women in different cultures with various support systems may not be affected by depression sign and symptoms equally. Thus, the ample social support that the mothers received from their families and friends bulwarks them against any negative consequences related to their relationship with their infants. Also, hiring of foreign maids in childcare may be available in several families who are financially stable to help mothers not feel overwhelmed in caring for their infants in different countries.

Data analysis of the current study did not detect any evidence for significance between pregnancy intention or postpartum infant bonding and incipient abuse domain of postpartum bonding scale. these results could be due to religious beliefs in Egyptian culture as the tendency to abort or abuse the children is barely noticed in the community.

This result was assured by **Kerstis, et al., (2016); and Farré-Sender, et al., (2018),** in which there is no significance between unplanned pregnancy and incipient abuse and this result may be

explained by the fact that the pregnant women in different cultures used to attend childbirth classes and training program which included relaxation and attachment behaviors practice, maternal role-promoting program to enhance maternal-fetal and maternal-neonatal attachment. This explanation supported by **Kordi, et al., (2016)** who found that guided imagery training enhanced maternal-fetal attachment during prenatal care, especially for women with unplanned pregnancy.

Conclusion

Returning to the research questions posed at the beginning of this study, it is now possible to state that the pregnancy intention has a significant impact on antenatal care service use, postpartum infant bonding, and maternal depression. One of the more significant findings to emerge from this study is that women with unintended pregnancy experienced lack of antenatal care service use, postpartum depression sign and symptoms, infant focused anxiety, and pathologic anger compared to women with intended pregnancy.

Recommendation

Based on the present study findings the following recommendations are formulated:

1. Further research is needed especially qualitative research.
2. Digital transformation in documentation of women`s data in all private and governmental hospitals for easily detection of those who are vulnerable to obstetric and mental health problems.
3. Prevention of unplanned pregnancy through increasing women awareness regarding family planning camps affiliated to ministry of health and population.
4. Routine screening of maternal depression sign and symptoms during the antenatal and the postpartum periods especially for those with unintended pregnancy with adequate psychiatric referral.
5. Identifying women with a current unplanned pregnancy and supporting them to access appropriate antenatal and delivery services.
6. Establishing psychosocial counseling clinic to offer psychological support services for couples who are at risk for psychological problems.

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