

Comparison Between Planned Versus Unplanned Pregnancy Outcomes

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Abstract: Unplanned pregnancies may be linked to increased medical costs; can have a negative effect on women's lives and result in poorer pregnancy outcomes than those that are planned. **Objective:** Identify the outcomes of planned versus unplanned pregnancy. **Settings:** El Shatby Maternity University Hospital affiliated to Alexandria University. **Results:** Unplanned pregnancy was significantly associated with PROM, labor complications, CS deliveries, induced onset of labor and shorter first stage. It was also significantly linked to fetal distress, lower Apgar score at one and five minutes, as well as need for resuscitation and oxygen administration, in addition to LBW and shorter stature. **Conclusion:** Unplanned pregnancy was correlated with adverse maternal and fetal pregnancy outcome. **Recommendations:** Health care providers should offer appropriate ANC and FP counseling to women, especially those who used to conceive unintentionally, to reduce its potential effects on maternal and fetal health.

Keywords: Planned pregnancy, unplanned pregnancy, pregnancy outcomes.

I. INTRODUCTION

Pregnancy and childbirth are joyful experiences for women. These events raise pleasure and satisfaction as well as concerns about accepting changes in family and social roles. Pregnancy planning is often measured as a dichotomous variable; it may be either planned or unplanned. Planned pregnancy is defined as that occurs at about the right time or later than desired. On the other hand, unplanned pregnancy is that reported to have been either unwanted (i.e. occurs when no children or no more children were desired) or mistimed (i.e. occurs earlier than desired). In planned pregnancy, the couple feels stronger; however, women need to get ready for a healthy pregnancy, childbirth, and childcare. On the contrary, unplanned and forced pregnancy makes mothers fearful and anxious ⁽¹⁻³⁾.

Globally, approximately 210 million women become pregnant each year; among them as many as 80 million have unplanned pregnancy ⁽⁴⁾. Over the past decade (2009- 2019), unplanned pregnancy prevalence rate ranged from 15% to 58% of pregnancies in North Africa and Middle East, where it was estimated as 58% in Yemen, 38% in Palestine, 32% in Morocco, 31% in Syria and Algeria as well as 23% in Egypt ⁽⁵⁾. Periodic estimation of unplanned pregnancy incidence is needed so that policy makers, researchers, and other stakeholders can track progress towards helping women and couples achieve their reproductive goals. It also helps demonstrate the need for contraceptive services; as well as the impact of programs and policies on unplanned pregnancies' outcomes. Additionally, this periodic estimation can be used to examine variations in how women resolve unplanned pregnancies across settings and over time ⁽⁶⁾.

Worldwide, unplanned pregnancies result mainly from failure or incorrect use of contraceptives, while in developing countries, they occur mainly due to using of traditional family planning methods rather than modern ones. Unplanned pregnancies are also caused by poor educational or economical status; lack of access to health services; peer pressure and sexual violence ⁽⁷⁾.

However, unplanned pregnancies may be linked to increased medical costs; can have a negative effect on women's lives and result in poorer outcomes than those that are planned. Many women with unplanned pregnancies may face high risk factors including delayed or no antenatal care, lack of self-care behaviors as well as increased risk of obstetric and medical complications. They are also more prone to prenatal and postnatal depression as well as relationship breakdown. Moreover, children of unplanned pregnancies have been shown to have prematurity; lower birth weight as well as poorer physical, mental and social health during childhood ^(1, 2, 8).

A key objective of the global public health policy is the reduction of the number of unplanned pregnancies. This can be carried out by improving access to consistent, effective, and affordable contraceptive methods ^(2, 8). Therefore, it is important for health care professionals and public health workers to offer a full range of contraceptive services to women who wish to delay or prevent pregnancy; educate them about the availability of contraceptive methods; as well as help them select an effective and appropriate method ⁽⁹⁾.

Thus, reduction of unplanned pregnancy rate has widespread positive effects on women's health and safety of childbirth as well as it is a major factor in creating healthy communities. Although unplanned pregnancy is a major public health burden and has a negative health consequence, its outcomes have not been researched in any depth. Therefore, this study was done to investigate this issue, so, unplanned pregnancy can be avoided in the future.

However, the aim of this study was to identify the outcomes of planned versus unplanned pregnancy.

II. MATERIALS AND METHOD

MATERIALS

Research Design:

A descriptive comparative retrospective research design was utilized in this study.

Setting:

The study was conducted at labor unit of El Shatby Maternity University Hospital affiliated to Alexandria University, Egypt.

Subjects:

A convenient sample of 150 laboring women, 75 with planned pregnancy and 75 with unplanned one were chosen from the previously mentioned setting according to the following criteria:

- With normal course of pregnancy
- Available at the time of data collection.
- Willing to participate in the study.

The sample size of pregnant women was estimated by using the Epi-Info 7 program, where the following parameters were applied:

- Population size 1300/3 months
- Expected frequency 50%
- Acceptable error 10%
- Confidence coefficient 95%
- Minimum sample size 89

Tools:

Three tools were developed and used by researcher to collect the necessary data:

Tool one:**Basic data structured interview schedule**

It entailed two parts:

Part I: socio-demographic data such as age; level of education; occupation; current residence; family type and income as well as crowding index and housing condition.

Part II:

- Reproductive history such as gravidity, parity, type of previous deliveries as well as complications of previous pregnancies and deliveries in addition to number of abortions, stillbirth, dead and living children.
- History of current pregnancy such as inter-pregnancy interval between current and last pregnancy; weeks of gestation; as well as number and place of antenatal visits in addition to sex and birth order of the fetus plus reasons for unplanned pregnancy.

Tool two:**Maternal pregnancy outcome assessment checklist**

It assessed:

- Onset of labor (spontaneous or induced).
- Mode of rupture of membranes (spontaneous or artificial).
- Time of rupture of membranes (mature or pre-mature).
- Type of delivery (normal or cesarean section).
- Duration and complications of each stage of labor (first, second, third & fourth).
- Medications received during labor.

Tool three:**Fetal pregnancy outcome assessment checklist**

It assessed:

- Presence of fetal distress.
- Fetal status (alive, stillborn or dead).
- Apgar score at one and five minutes.
- Need for resuscitation and oxygen administration
- Meconium aspiration and presence of caput succedaneum.
- Newborn's measurements (weight, height, head and chest circumferences).

METHOD

The study was accomplished according to the following steps:

1. Approval was obtained from the Ethical Committee, Faculty of Nursing, Alexandria University, Egypt.
2. Official letter from the Faculty of Nursing, Alexandria University was directed to the responsible authority of the study setting to take his permission to collect data after explaining the purpose of the study.

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3. The study tools were developed by the researcher based on extensive review of recent and relevant literature.
4. Tools were tested for content validity by a jury of 5 experts in the field.
5. Tools were checked for their reliability by Cronbach's alpha test and the result was reliable (0.724).
6. A pilot study was carried out on 8 laboring women with planned pregnancy and 7 with unplanned one (excluded from the study sample) to test the feasibility of the study, ascertain relevance, clarity and the applicability of the tools as well as detect any problem peculiar to the statements as sequence and clarity that might interfere with the process of data collection. After conducting the pilot study, it was found that the sentences of the tool were clear and relevant; however, few words had been modified. Following this pilot study, the tool was revised, reconstructed and made ready for use.
7. Collection of data covered a period of 6 months, starting from the beginning of June till the end of November 2019, 3 days/week; 2 laboring women /day.
8. Statistical analysis:
 - The collected data were categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 23 program.
 - Cross tabulation was carried out to explore the relationships between variables.
 - A descriptive and analytical statistics were used such as percentages; whereas Chi-square-test and Fisher Exact-test were used to find out the difference in the results at 0.05 level of significance.

Ethical consideration:

For each recruited subject the following issues were considered: securing the subjects' written informed consent, keeping their privacy and right to withdraw at any time as well as assuring confidentiality of their data.

III. RESULTS

Table (I) elucidates the number and percent distribution of laboring women according to their pregnancy outcome. It was revealed that induced onset of labor was noticed among 18.67% of unplanned pregnancy group, compared to 13.33% of planned pregnancy group. PROM was also noticed among 81.33% of the former group, compared to 53.33% of the latter group. In addition, CS deliveries were undergone by more than two-fifths (42.67%) of unplanned pregnancy group, compared to one-fifth (20%) of planned pregnancy group. A highly statistically significant difference was observed between the two groups in relation to time of rupture of membranes ($P=0.000$), while a statistically significant difference was noted between them concerning type of delivery ($P=0.003$).

Table (II) demonstrates the number and percent distribution of laboring women according to their duration of labor. Shorter 1st stage of labor (4-<6 hours) was observed among 13.95% of unplanned pregnancy group, compared to 5% of planned pregnancy group.

Table (III) illustrates the number and percent distribution of laboring women according to their incidence of labor complications and received medications. Labor complications were experienced by 36% of unplanned pregnancy group, compared to 6.67% of planned pregnancy group. Meanwhile, uterine inertia and hemorrhage were experienced by 33.33% & 14.82% respectively of the former group, compared to none of the latter group. In addition, antibiotics and spinal anesthesia were received by 66.67% & 42.67% respectively of unplanned pregnancy group, compared to 49.33% & 20% respectively of planned pregnancy group. A highly statistically significant difference was observed between the two groups in relation to incidence of labor complications ($P=0.000$), while a statistically significant difference was noted between them concerning type of medications received ($P=0.043$).

Table (IV) expounds the number and percent distribution of laboring women according to fetal/ neonatal pregnancy outcome. Fetal distress was observed among 42.67% of unplanned pregnancy group, compared to 26.67% of planned pregnancy group. Apgar score at 1 minute also showed severe asphyxia among 44% of the former group, compared to 17.33% of the latter group. Meanwhile, Apgar score at 5 minutes, revealed mild and severe asphyxia among 42.67% of the unplanned pregnancy group, compared to 6.67% of planned pregnancy group. Therefore, neonatal resuscitation and

oxygen administration were needed for 44% & 84% respectively of unplanned pregnancy group, compared to 12% & 60% respectively of planned pregnancy group. However, the relationship between the two groups was highly statistically significant regarding Apgar score at 5 minutes and need for resuscitation ($P=0.000$); while it was statistically significant concerning fetal distress (0.039), Apgar score at 1 minute and need for oxygen administration ($P=0.001$).

Table (V) reveals the number and percent distribution of laboring women according to fetal/ neonatal measurement. It was observed that that 60% of unplanned pregnancy group had LBW (<2.5 kg), compared to 10.67% of planned pregnancy group. In addition, 17.14% of the former group had short newborns (<46 cm), compared to 5.33% of the latter group. Highly statistically significant difference was observed between the two groups' birth weight ($P=0.000$), while statistically significant difference was noted between their neonates' length ($P=0.023$).

IV. DISCUSSION

Unplanned pregnancy is known as one of the most important public health issues, especially in the developing countries. It is associated with adverse effects on women, fetuses, children, families, and society. Unplanned pregnancy is one of the direct causes of maternal morbidity/ mortality during pregnancy, childbirth and postpartum period. It also has long-term influences on child health as it affects infant growth and leads to higher rates of infant morbidity and mortality. In addition, unplanned pregnancy imposes astronomical direct and indirect financial costs on individuals, couples governments and societies ⁽¹⁰⁾ (Bishwajit et al., 2017). Therefore, the aim of this study was to identify the outcomes of planned versus unplanned pregnancy.

Maternal pregnancy outcome

The results of the present study revealed that *induced onset of labor and shorter first stage of labor* was slightly more likely to be attributed to unplanned pregnancy, although the relationship was not statistically significant. Meanwhile, *PROM and other complications (e.g., maternal distress, uterine inertia & hemorrhage)* were highly significantly related to unplanned pregnancy. In addition, *CS deliveries* were significantly 2 times higher with unplanned pregnancy than planned one (Tables I-III). This was expected since unplanned pregnancies are associated with adverse birth outcomes. It was also hypothesized that psychological factors associated with unplanned pregnancy such as anxiety and inability to cope with stress may cause an increase in the level of stress-related hormones, which can lead to dystocia by reducing uterine contractility, therefore, an emergency CS is then sometimes considered as the safest way to overcome a complicated delivery.

The present findings, in one hand, are compatible with a study fulfilled in Flanders, Belgium, where it was evident that shorter duration of delivery as well as shoulder dystocia and other complications were significantly associated with unwanted pregnancies. On the other hand, they are not coincident with the same study, which denoted that onset of labor; CS & PROM were not significantly related to unwanted pregnancies ⁽¹¹⁾ (Goossens et al., 2016). The variance between the finding of this study and the current one may be attributed to different research design and inclusion criteria as well as large sample size.

The current finding is partly in harmony with a study carried out in Tehran, Iran, where it was found that CS delivery in unintended pregnant women was 1.32 times of intended pregnant women ⁽¹²⁾ (Omani-Samani et al., 2019). It also partly falls in line with a survey implemented in Uttar Pradesh, India, where participants with unintended pregnancy were highly significantly more likely to experience severe bleeding (hemorrhage) during delivery, which may contribute to the high maternal mortality rates in the region. This may be due to the fact that they reported no or less than 4 ANC visits ⁽¹³⁾ (Dehingia et al., 2020).

Fetal / neonatal pregnancy outcome

The results of the current study established that low Apgar score at five minutes, need for resuscitation and LBW were highly significantly associated with unplanned pregnancy. Fetal distress, lower Apgar score at one minute, need for oxygen administration and shorter stature were also significantly associated with unplanned pregnancy (Table IV & V). This may be due to the fact that women with unintended pregnancies are less likely to receive adequate ANC, more prone to get suboptimal nutritional supplements (e.g., folic acids, micronutrients) and to have more unhealthy behaviors during pregnancy.

The present finding is partly concordant with a cohort study, which documented that women with unplanned pregnancies had a statistically significantly higher probability of LBW baby ⁽¹⁴⁾ (**Garipey et al., 2015**). It is also partly coincidental with a cohort study, which indicated that unplanned pregnancy was highly significantly associated with very LBW and greater post-delivery neonatal care requirements ⁽¹⁵⁾ (**Wotherspoon et al., 2017**). In addition, the current finding partly falls in line with a study conducted in Sohag district, Upper Egypt, where, high prevalence of LBW among mistimed and unwanted pregnancies was shown ⁽⁵⁾ (**Mohamed et al., 2019**).

Moreover, the present finding is consistent with a research executed in US, where it was reported that children born as a result of an unplanned pregnancy are significantly more likely to have poorer health and score worse on Apgar scores, compared to children born as a result of a planned pregnancy ⁽¹⁶⁾ (**National Conference of State Legislatures, 2020**).

In contrast, the present finding doesn't correspond with a study fulfilled in Flanders, Belgium, where no statistically significant differences were found between unplanned pregnancies and neonatal outcomes ⁽¹¹⁾ (**Goossens et al., 2016**). It also doesn't partly conform to a study implemented in Tehran, Iran, where no statistically significant relationship was observed between unintended pregnancy and low birth weight ⁽¹²⁾ (**Omani-Samani et al., 2019**). The dissimilarity between the finding of these studies and the current one may reflect different research design and inclusion criteria as well as large sample size.

V. CONCLUSION

Based on the findings of the present study, it can be concluded that unplanned pregnancy was correlated with adverse maternal pregnancy outcome; it was highly significantly associated with PROM and labor complications; significantly affiliated to CS deliveries as well as almost corresponded to induced onset of labor and shorter first stage. In addition, unplanned pregnancy was relevant to adverse fetal / neonatal pregnancy outcome; it was highly significantly associated with lower Apgar score at five minutes, need for resuscitation and LBW as well as significantly corresponded with fetal distress, lower Apgar score at one minute, need for oxygen administration and shorter stature.

VI. RECOMMENDATIONS

Based on the findings of the present study, the following recommendations are suggested:

Recommendations related to policymakers:

- Greater efforts are needed to provide comprehensive health care for high-risk women to help reduce unplanned pregnancies.
- Factors that affect the high rate occurrence of unplanned pregnancy should be identified and given priority attention.
- Health policy and strategies should ensure that all pregnant women receive ANC in a timely manner and make at least four visits before delivery to help identify health complications of unintended pregnancy as well as reduce maternal, new-born and infant mortality.

Recommendations related to mass media:

- Health education programs on unplanned pregnancy and contraceptives should be promoted through mass media, including the national radio and TV as well as a wide range distribution of informative literature.
- Strengthening mass media campaigns on the benefits of adherence to receiving adequate or recommended number of ANC visits would further motivate women and enhance their greater utilization of ANC services.

Recommendations related to ANC:

- Health care providers should be trained to screen all women for their pregnancy intention during ANC visits.
- Antenatal care services should be provided to women with unintended pregnancy to reduce its potential effects on maternal and fetal health.
- Health care providers should offer appropriate counseling to women, especially those who used to conceive unintentionally, to minimize the possibility of delaying ANC initiation.

Recommendations related to family planning:

- Postnatal contraceptive counseling to all mothers giving birth at health institutions should be reinforced to reduce unplanned pregnancy.
- Married women of reproductive age should be empowered to delay or avoid pregnancies whenever they need to do so; through high-quality FP counseling with a client-centered approach and continued use of modern contraceptives.
- Higher efficacy and continuation rates postpartum contraception (e.g., LARC) should be used to protect against short IPI.
- Raising women awareness about emergency contraceptives is imperative in case of unprotected intercourse to prevent unwanted pregnancy.

Recommendations related to further studies:

- A qualitative study is highly recommended to assess mothers' feeling regarding unintended pregnancy.
- Assess the prevalence and factors associated with unplanned pregnancy among Egyptian mothers attending public hospitals in rural areas.
- Study of unplanned pregnancy prevention is needed for women with lower SES as they are the main target group at high-risk.

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APPENDICES - A

List of table:

Table (I): Number and percent distribution of laboring women according to their pregnancy outcome

Maternal pregnancy outcome	Planned pregnancy group (75)		Unplanned pregnancy group (75)		F/ χ^2 (P)
	No	%	No	%	
Onset of labor:					
– Spontaneous	65	86.67	61	81.33	0.794 (0.373)
– Induced	10	13.33	14	18.67	
Time of rupture of membranes:					
– Mature	35	46.67	14	18.67	13.366 (0.000)**
– Premature	40	53.33	61	81.33	
Type of delivery:					
– Normal vaginal	60	80.00	43	57.33	8.955 (0.003)*
– Caesarean section	15	20.00	32	42.67	

More than one response

F (P): Fisher Exact Test & P for FET-Test

χ^2 (P): Chi-Square Test & P for χ^2 Test

*: Significant at $P \leq 0.05$

Table (II): Number and percent distribution of laboring women according to their duration of labor

Duration of labor	Planned pregnancy group (60) ^o		Unplanned pregnancy group (43) ^o		F/ χ^2 (P)
	No	%	No	%	
1st stage (hours):					
4-<6	3	05.00	6	13.95	2.521 (0.283)
6-8	48	80.00	31	72.09	
9-13	9	15.00	6	13.95	
2nd stage (minutes):					
15-30	2	03.33	3	06.98	0.72 (0.396)
45-120	58	96.67	40	93.02	
3rd stage (minutes):					
8	1	01.67	0	00.00	0.928 (0.629)
10-20	55	91.67	41	95.35	
25-30	4	06.67	2	04.65	

^o: 15 laboring women with planned pregnancy & 32 with unplanned pregnancy undergone CS delivery

F (P): Fisher Exact Test & P for FET-Test

χ^2 (P): Chi-Square Test & P for χ^2 Test

*: Significant at $P \leq 0.05$

** : Highly Significant at $P \leq 0.05$

Table (III): Number and percent distribution of laboring women according to incidence of labor complications and received medications

Incidence of labor complications and received medications	Planned pregnancy group (75)		Unplanned pregnancy group (75)		F/ χ^2 (P)
	No	%	No	%	
Complications of labor:					
- Present	5	06.67	27	36.00	19.227 (0.000)**
- Absent	70	93.33	48	64.00	
Type of complications: #	(n=5)		(n=27)		
- Prolonged labor	1	20.00	7	25.93	4.544 (0.337)
- Genital injury	3	60.00	8	29.63	
- Uterine inertia	0	00.00	9	33.33	
- Hemorrhage	0	00.00	4	14.82	
- Retained placenta	2	40.00	5	18.52	
Type of medications received during labor: #					
- Oxytocics	75	100.0	75	100.0	8.156 (0.043)*
- Antibiotics	37	49.33	50	66.67	
- Local anesthesia	50	66.67	40	53.33	
- Spinal anesthesia	15	20.00	32	42.67	

More than one response

F (P): Fisher Exact Test & P for FET-Test

χ^2 (P): Chi-Square Test & P for χ^2 Test

*: Significant at $P \leq 0.05$

** : Highly Significant at $P \leq 0.05$

Table (IV): Number and percent distribution of laboring women according to fetal/ neonatal pregnancy outcome

Fetal / neonatal pregnancy outcome	Planned pregnancy group (75)		Unplanned pregnancy group (75)		F/ χ^2 (P)
	No	%	No	%	
Fetal distress:					
- Present	20	26.67	32	42.67	4.239 (0.039)*
- Absent	55	73.33	43	57.33	
Apgar score at 1 minute:					
- Normal (7-10)	27	36.00	13	17.33	14.158 (0.001)*
- Mild asphyxia (4-6)	35	46.67	29	38.67	
- Severe asphyxia (0-3)	13	17.33	33	44.00	
Apgar score at 5 minutes:					
- Normal (7-10)	70	93.33	43	57.33	26.576 (0.000)**
- Mild asphyxia (4-6)	5	06.67	27	36.00	
- Severe asphyxia (0-3)	0	00.00	5	06.67	
Need for resuscitation:					
- Yes	9	12.00	33	44.00	19.048 (0.000)**
- No	66	88.00	42	56.00	
Need for oxygen administration:					
- Yes	45	60.00	63	84.00	10.714 (0.001)*
- No	30	40.00	12	16.00	

More than one response

F (P): Fisher Exact Test & P for FET-Test

χ^2 (P): Chi-Square Test & P for χ^2 Test

*: Significant at $P \leq 0.05$

** : Highly Significant at $P \leq 0.05$

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Table (V): Number and percent distribution of laboring women according to neonatal measurements

Newborn's measurements	Planned pregnancy group (75)		Unplanned pregnancy group (75)		F/ χ^2 (P)
	No	%	No	%	
Weight (kg):					
< 2.5	8	10.67	45	60.00	41.872 (0.000)**
2.5 - 4	67	89.33	29	38.67	
> 4	0	00.00	1	01.33	
Length (cm):			(n=70) °		
< 46	4	05.33	12	17.14	5.144 (0.023)*
46-56	71	94.67	58	82.86	

°: 5 laboring women with unplanned pregnancy had intra uterine fetal death and stillborn

F (P): Fisher Exact Test & P for FET-Test

χ^2 (P): Chi-Square Test & P for χ^2 Test

*: Significant at $P \leq 0.05$

**: Highly Significant at $P \leq 0.05$