Correlates of unintended pregnancy in Beheira governorate, Egypt

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العوامل المرتبطة بحدوث الحمل غير المقصود في محافظة البحيرة، في مصر

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الخلاصة: تناولت هذه الدراسة تواتر ومحدِّدات حدوث الحمل غير المنظم بين السيدات في محافظة البحيرة، في مصر، وتأثير الحمل غير المقصود على الرعاية التي تلتمسها الأم لنفسها أو لطفلها قبل الولادة وبعدها. وبلغت نسبة الولادات غير المقصودة 23.6٪ من جميع الولادات، كما بلغت نسبة الولادات غير المرغوبة 13.8٪ والولادات التي جاءت في توقيت غير مناسب 9.8٪. وتبين الدراسة أن 28.8٪ من حالات الحمل غير المقصود نجمت عن فشل موانع الحمل، وأن 47.1٪ من جميع السيدات لا يستخدمن موانع الحمل. وخلصت الدراسة أيضاً إلى أن السن، ومستوى التعليم، وعدد مرات الولادة هي العوامل التي لها علاقة بحدوث الحمل غير المرغوب. كما تبيّن الدراسة أن نمط استعمال موانع الحمل والوضع الوظيفي للأم هما العاملان المحددان لحدوث الحمل في توقيت غير مناسب. وقد كان الحمل غير المرغوب عائقاً أمام التماس الأم للرعاية قبل الولادة، وليس أمام رعاية الطفل. وتوحي نتائج البحث بضرورة أن تتم في إطار برامج تنظيم الأسرة مساعدة السيدات اللاتي هن في سن الإنجاب على المباعدة بين الولادات ووضع حدود للخصوبة.

ABSTRACT This study looked at the frequency and determinants of unplanned births among women in Beheira governorate, Egypt, and the effects on antenatal and postnatal care sought by the mother for herself and her child. Unintended births comprised 23.6%; 13.8% were unwanted and 9.8% were mistimed. Contraceptive failure accounted for 28.8% of unintended pregnancies; 47.1% of all women used no contraception. Age, education and parity were predictors of unwanted pregnancy. Contraceptive use and maternal employment status predicted mistimed pregnancy. Unintended pregnancy was a barrier to antenatal care, but not to child care. Our findings suggest that family planning programmes should help women of reproductive age achieve spacing and fertility limits.

Corrélats des grossesses non désirées dans le Gouvernorat de Beheira (Egypte)

RESUME La présente étude a examiné la fréquence et les déterminants des grossesses non planifiées chez des femmes dans le Gouvernorat de Beheira (Egypte), et les effets sur les soins prénatals et postnatals recherchés par la mère pour elle-même et pour son enfant. Les grossesses involontaires, représentaient 23,6 %; 13,8 % étaient non désirées et 9,8 % étaient inopportunes. L'échec de la contraception expliquait 28,8 % des grossesses non désirées ; 47,1 % de la totalité des femmes n'utilisaient pas de moyen de contraception. L'âge, l'éducation et la parité étaient des facteurs prédictifs de la grossesse non désirée. L'utilisation de contraceptifs et la situation de la mère au regard de l'emploi étaient des éléments prédictifs de la grossesse inopportune. La grossesse non désirée était un obstacle aux soins prénatals, mais pas aux soins infantiles. Nos constatations laissent penser que des programmes de planification familiale devraient aider les femmes en âge de procréer à espacer les naissances et à contrôler leur fécondité.

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Introduction

Since the 1960s, family planning programmes have played a key role in slowing population growth, with 30%–50% of the decline in fertility in developing countries attributed to them [*1*]. The programmes have helped to improve public awareness and change attitudes and promote behaviours that favour fertility regulation. In Egypt, contraception use has gained wide acceptance. The proportion of married women of reproductive age using contraceptives increased during 1980–95 from 24.6% to 49.2% [2], and to 56.1% in 2000 [*3*], with a consequent decline in the total fertility rate from 5.3 births per woman in 1980 to 3.5 births per woman in 2000 [*3*]. More importantly, ideal fertility preference dropped from 4.0 children in 1980 [2] to 2.9 children in 2000 [*3*].

Examining ideal and actual fertility preferences of Egyptian women shows a clear gap between the two, with 61.6% of women having more children than they want [2]. It is not unlikely that this gap is to some extent the result of unintended pregnancy resulting in a live birth. Indeed, unintended pregnancies not only lead to unnecessary increases in fertility [*3*], but also endanger the health and welfare of the mother, and possibly the child. A number of studies have shown that nearly half of all unintended pregnancies end in abortion [*4,5*], and that women who decide to carry their pregnancy to term tend to place less value on their pregnancy, as reflected in their lower tendency to seek antenatal care [*6–10*]. The effect of pregnancy intention on the child is uncertain. Some studies have suggested a link between unintended pregnancy and the child subsequently suffering a lack of care [*11–13*], while others have shown no effect [*13–15*]. The lack of consistency in these findings may be because so much of the behaviour surrounding pregnancy and motherhood is strongly culturally determined.

We undertook this study to determine the frequency of births resulting from unintended pregnancy in the Beheira governorate of Egypt and to examine the determinants of unintended pregnancy as well as its effects on the care sought for the mother and her child.

Methods

A house-to-house survey was conducted in Beheira governorate between January and July 2001. The target population was women with at least one child aged three years or under. The cluster sample technique was adopted to enrol eligible women. From each of 30 clusters, 30 women meeting the inclusion criteria were selected, yielding a total of 900 women. Eligible women were interviewed using a pre-tested questionnaire to collect relevant information.

Questionnaire

The questionnaire consisted of four sections. Section I covered the sociodemographic characteristics of enrolled women and their husbands, including age, level of education, occupation, rural or urban residence, type of family and family size. Section II covered previous reproductive history: total number of pregnancies and deliveries, pregnancy outcome, number and sex of living children and use of contraception. Section III related to the history of the pregnancy of the most recent birth, including pregnancy intention status, the use of contraception at the time of conception, course of the pregnancy and delivery, and the care sought. Pregnancy intention status was obtained by asking the woman:

At the time you became pregnant with your last child, did you want the child at that time (planned pregnancy), did you want to wait a longer time before becoming pregnant (mistimed), or you did not want any more children (unwanted)'. Planned pregnancies were considered 'intended'. Pregnancies that were mistimed or unwanted were considered 'unintended'. Section IV covered information on the most recent birth, including timing of delivery, birth weight, breastfeeding, well-baby care and vaccinations received.

Of the 900 questionnaires, 20 (2.2%) were incomplete and excluded from the analysis, giving a final sample size of 880 women. Data were analysed using the *SPSS*, version 8 and *Epi-Info* software. The mean, standard deviation, odds ratio (OR) and 95% confidence interval (CI) were computed. The chi-squared and Student *t*-test were used to test for significance ($P < 0.05$). Pregnancy intention status was modelled as a function of couples' sociodemographic characteristics and women's past reproductive history.

Results

This study included 880 women with an age range of 18–52 years (mean 28.97 ± 5.77 years). All women had at least one child, up to a maximum of nine children, with their most recent child aged three years or less. Just over three-quarters of the women (76.4%) reported having planned the pregnancy of their most recent birth, with 23.6% (95% CI: 20.8–26.4) reporting that the conception of their most recent birth was unintended: 13.8% (95% CI: 11.48–16.02) unwanted and 9.9% (95% CI: 7.91–11.85) mistimed.

The pregnancy intention status of the most recent birth in relation to women's social background is shown in Table 1. The risk of unintended pregnancy did not vary in relation to rural/urban residence, type of house and type of family. However, the risk of unwanted pregnancy was significantly lower among women living in extended and joint families compared with those living in nuclear families (OR: 0.38; 95% CI: 0.20–0.70).

The mean family size of women whose pregnancy was unintended was significantly higher than those whose pregnancy was planned ($t = 7.540$, $P < 0.001$). Compared to women who planned their pregnancy, the mean family size was significantly higher among those whose pregnancy was unwanted ($t = 9.104$, $P < 0.001$), but not among those who mistimed their pregnancy ($t = 1.625$, $P = 0.105$). Similarly, the mean crowding index and sleeping index were significantly higher among women whose pregnancy was unintended compared to those whose pregnancy was planned ($t = 7.295$, $P < 0.001$ and $t = 5.444$, $P < 0.001$ respectively). There was no significant difference between women who mistimed their pregnancy and those who planned their pregnancy in respect to the mean crowding ($t = 1.669$, $P = 0.096$) and sleeping index ($t = 1.121$, $P = 0.263$). However, compared with those who planned their pregnancy, the mean crowding and sleeping index was significantly higher among women whose pregnancy was unwanted ($t = 8.773$, $P < 0.001$ and $t = 6.623$, $P < 0.001$ respectively).

Table 2 shows that in respect of couples' ages at the time of conception, the risk of unintended pregnancy increased significantly with the increase in women's age at the time of conception relative to the youngest age group (χ^2 of linear trend = 74.603, $P < 0.001$). The risk of unwanted pregnancy increased significantly with increasing maternal age (χ^2 of linear trend = 147.357, $P < 0.001$), whereas no signifi-

Table 1 Pregnancy intention status in relation to social background of 900 women in the Beheira governorate, Egypt, 2001

Social background	Intended (n = 672)		Unintended				Total unintended (n = 208)	
			Mistimed (n = 87)		Unwanted (n = 121)			
	No.	%	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Residence								
Urban	330	49.1	49.4	1.00	41.3	1.00	44.7	1.00
Rural	342	50.9	50.6	0.99(0.62–1.58)	58.7	1.37(0.91–2.07)	55.3	1.19(0.86–1.65)
Type of house								
Owned	578	86.0	86.2	1.00	90.1	1.00	88.5	
Rented	94	14.0	13.8	0.98(0.49–1.95)	9.9	0.68(0.34–1.32)	11.5	0.80(0.48–1.32)
Type of family								
Nuclear	472	70.2	63.2	1.00	72.7	1.00	68.8	1.00
Joint }	117	17.4	18.4		9.9		13.5	
Extended }	83	12.4	18.4	1.38(0.84–2.26)	17.4	0.38(0.20–0.70)	17.7	1.07(0.76–1.52)
	Intended		Mistimed		Unwanted		Total unintended	
Family size								
Mean ± s	5.12 ± 2.103		5.51 ± 1.892		7.04 ± 2.311		6.39 ± 2.271	
Range	3–16		3–11		3–22		3–22	
Crowding index								
Mean ± s	1.38 ± 0.544		1.48 ± 0.483		1.88 ± 0.744		1.71 ± 0.675	
Range	0.42–5.00		0.63–3.00		0.71–7.00		0.63–7.00	
Sleeping index								
Mean ± s	2.42 ± 0.902		2.54 ± 0.855		3.03 ± 1.087		2.82 ± 1.024	
Range	0.83–7.50		1.33–6.00		1.00–7.00		1.00–7.00	

s = *standard deviation.*

cant trend was observed among those whose recent birth was mistimed (χ^2 of linear trend = 0.257, P = 0.612). The mean age of women who mistimed their pregnancy (25.45 ± 4.325 years; 95% CI: 24.53–26.38) was comparable to those who planned it (25.63 ± 4.915 years; 95% CI: 25.26–26.00) but women whose pregnancy was unwanted were significantly older at the time of conception than the other two groups (33.01 ± 5.460 years; 95% CI: 32.02–33.98).

With respect to husband's age at the time of conception, the risk of unintended pregnancy increased significantly with increasing paternal age and reached 45.20 in those aged over 50 years (χ^2 of linear trend = 96.230, $P < 0.001$). However, the majority of planned (92.0%) and mistimed (93.1%) pregnancies were conceived at husband's age of less than 40 years, whereas just over half (51.2%) of unwanted pregnancies occurred above this age. The mean age of husbands at the time of conception was comparable for planned (32.37 ± 5.459 years; 95% CI: 31.96–32.79) and mistimed pregnancy (32.22 ± 4.779 years; 95% CI: 32.20–34.23) and was significantly higher for unwanted pregnancies (40.24 ± 6.414 years; 95% CI: 39.08–41.39).

Excess risk of unintended pregnancy was observed in relation to women's level of education (Table 2). Relative to university graduates, the odds of unintended pregnancy were nearly twice as high among women who were illiterate or just able to read and write, and for those who had accomplished their basic education. It was lower among those who were holding a high-school certificate. This trend was significant statistically (χ^2 for linear trend = 14.422, $P < 0.001$). The risk of unwanted pregnancy increased significantly the lower the women's educational attainment (χ^2 of linear trend = 25.106, $P < 0.001$), but such risk was not observed among women who mistimed their pregnancy (χ^2 of linear trend = 0.076, P = 0.782). With respect to husband's level of education, there was no significant association with the risk of unintended pregnancy (χ^2 for linear trend = 1.017, P = 0.313). However, relative to husbands with a university degree, the risk of unwanted pregnancy increased significantly among the spouses of those with lower educational attainment (χ^2 of linear trend = 7.705, P = 0.006) but this trend was not observed among those whose spouses mistimed their pregnancy (χ^2 of linear trend = 2.919, P = 0.088).

The risk of unintended pregnancy (Table 2) did not vary between husband's occupational categories (χ^2 of linear trend = 0.147, P = 0.702) for both unwanted (χ^2 of linear trend = 0.016, P = 0.901) and mistimed pregnancies (χ^2 of linear trend = 0.236, P = 0.627). Similarly, the risk of unintended pregnancy did not vary with respect to woman's work status. However, among non-working women the risk of mistimed pregnancy was significantly higher but not that of unwanted pregnancy.

Pregnancy intention in relation to women's past reproductive history is shown in Table 3. Pregnancy intention status was not associated with an increased risk of abortion or miscarriage. However, the risk of miscarriage was significantly higher among women whose pregnancy was unwanted but not for those who mistimed their pregnancy.

The odds of unintended pregnancy increased with the increase in the number of surviving children (Table 3). Relative to women who did not have children, or those who had only one child prior to the birth of the index child, the risk of unintended pregnancy ranged from 5.05 among those who had three surviving children to 24.08

Table 2 Pregnancy intention status in relation to couple's demographic characteristics

Demographic characteristic	Intended (*n* = 672)		Unintended				Total unintended (*n* = 208)	
			Mistimed (*n* = 87)		Unwanted (*n* = 121)			
	No.	%	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Woman's age at conception (years)								
< 20	71	10.6	9.2	1.00	–		3.8	1.00
20–29	481	71.6	71.3	1.44 (0.52–2.49)	30.6	1.00	47.6	1.83 (0.85–3.91)
30–39	113	16.8	19.5	1.26 (0.52–3.06)	60.3	9.64 (6.17–15.02)	43.3	7.07 (3.23–15.45)
40–49	7	1.0	–		9.1	23.44 (8.58–63.98)	5.3	13.95 (4.21–46.15)
Husband's age at conception (years)								
20–29	231	34.4	19.5	1.00	5.0	1.00	11.1	1.00
30–39	387	57.6	73.6	2.25 (1.28–3.92)	43.8	5.27 (2.23–12.45)	56.3	3.04 (1.88–4.88)
40–49	52	7.7	5.8	1.31 (0.46–3.70)	44.6	39.98 (16.32–97.85)	28.3	11.40 (6.45–20.11)
50+	2	0.3	1.1	6.79 (6.79–0.58)	6.6	154.00 (26.79–884.67)	4.3	45.20 (9.21–221.83)
Woman's education								
Illiterate or read & write	122	18.2	19.6	1.18 (0.56–2.47)	34.7	3.97 (1.95–8.07)	28.4	2.36 (1.39–3.98)
Primary or preparatory	48	7.1	5.7	0.88 (0.30–2.55)	13.2	3.85 (1.66–8.88)	10.1	2.14 (1.09–4.15)
Secondary	375	55.8	57.5	1.13 (0.61–2.07)	43.0	1.60 (0.81–3.16)	49.0	1.33 (0.83–2.14)
University or higher	127	18.9	17.2	1.00	9.1	1.00	12.5	1.00
Husband's education								
Illiterate or read & write	101	15.0	10.3	0.58 (0.27–1.25)	20.6	2.27 (1.24–4.14)	16.3	1.28 (0.79–2.07)
Primary/preparatory	41	6.1	2.3	0.32 (0.07–1.37)	9.1	2.46 (1.12–5.38)	6.3	1.21 (0.61–2.40)
Secondary	301	44.8	47.2	0.89 (0.55–1.44)	49.6	1.83 (1.11–3.00)	48.6	1.28 (0.89–1.84)
University or higher	229	34.1	40.2	1.00	20.7	1.00	28.8	1.00
Husband's occupation								
Professional or semiprofessional	393	58.5	63.2	1.00	57.9	1.00	60.1	1.00
Skilled or semiskilled	89	13.2	10.3	0.72 (0.34–1.51)	13.2	1.01 (0.56–1.82)	12.0	0.88 (0.54–1.44)
Manual	100	14.9	12.7	0.79 (0.39–1.56)	18.2	1.24 (0.72–2.09)	15.9	1.04 (0.66–1.61)
Others (drivers/traders)	90	13.4	13.8	0.95 (0.48–1.85)	10.7	0.81 (0.43–1.53)	12.0	0.87 (0.53–1.42)
Woman's work status								
Working	209	31.1	19.5	1.00	29.8	1.00	25.5	1.00
Not working	463	68.9	80.5	1.86(1.04–3.37)	70.2	1.07(0.68–1.66)	74.5	1.32(0.92–1.91)

among those who had five or more surviving children (χ^2 for linear trend = 150.442, $P < 0.001$). Compared with women who planned their pregnancy, the increase in the number of surviving children increased the risk of unwanted pregnancy significantly (χ^2 for linear trend = 271.536, $P < 0.000$), but not of mistimed pregnancy (χ^2 for linear trend = 0.039, $P = 0.843$).

Regarding the sex of surviving children, women with unintended pregnancy were nearly three times more likely to have surviving sons and daughters relative to those who planned their pregnancy. Examining the subcategories of unintended pregnancy revealed that women whose pregnancy was unwanted were seven times more likely to have surviving sons and daughters relative to those who planned their pregnancy. However, the difference was not observed between women who planned their pregnancy and those who mistimed it (Table 3).

The risk of unintended pregnancy (Table 3) was twice as high among women who reported never using contraception. Women whose pregnancy was mistimed were significantly more likely never to have used contraception. This was not the case for those whose pregnancy was unwanted.

Only 28.8% (60/208) of the women with unintended pregnancy were contraceptive users at the time of conception. Methods included oral contraceptives, 63.3% (38/60), intrauterine devices, 30% (18/60) and condom use by husbands, 6.7% (4/60). Of the others, 24.1% (50/208) relied on being amenorrhoeic and 47.1% (98/208) were not using any contraceptive method at the time they became pregnant. The women who were not using any contraceptive method at the time they became pregnant represented 11.1% of the total number of women surveyed which indicates the proportion of the surveyed population that have an 'unmet need' for family planning.

Pregnancy intention status was modelled as a function of couples' sociodemographic characteristics as well as women's past reproductive history. Three models were constructed to determine the independent predictors of unintended pregnancy (unwanted + mistimed), as well as pregnancies that were unwanted or mistimed separately (Table 4). Independent predictors of unintended pregnancy were women's age of 30 years or over, husband's age 40 years or over, non-working women, having three or more surviving children, having surviving sons and daughters, and never having used contraceptives. Independent predictors of unwanted pregnancy were women's age of 30 years or over, husband's age of 40 years or over, husband having less than a university degree, having three or more surviving children and having surviving sons and daughters. Independent predictors of mistimed pregnancy were non-working women and never users of contraceptives. These models explained more than 80% of the variation in the pregnancy intention status as indicated by their sensitivity.

Pregnancy intention status in relation to maternity care during the pregnancy in the most recent birth, after controlling for the confounding effect of women's educational attainment, is shown in Table 5. Women whose pregnancy was unintended were significantly more likely not to seek antenatal care or not to have received at least one dose of the tetanus toxoid vaccine. Relative to those who planned their pregnancy, women whose pregnancy was unwanted were significantly more likely not to seek antenatal care, nor to have received at least one dose of the tetanus toxoid vaccine. Such excess risk was not observed among those who mistimed their pregnancy. For those who sought antenatal care, unintended pregnancy was not found to be associat-

Table 3 **Pregnancy intention status in relation to woman's past reproductive history**

Past reproductive history	Intended (n = 672)		Unintended				Total unintended (n = 208)	
			Mistimed (n = 87)		Unwanted (n = 121)			
	No.	%	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Miscarriage								
No	580	86.3	87.4	1.00	77.7	1.00	81.7	1.00
Yes	92	13.7	12.6	0.91(0.44–1.85)	22.3	1.81(1.09–3.00)	18.3	1.41(0.93–2.13)
Abortion								
No	*666*	99.1	98.9	1.00	99.2	1.00	99.0	1.00
Yes	6	0.9	1.1	1.29(0.3–10.83)	0.8	0.93(0.02–7.73)	1.0	1.08(0.22–5.38)
Use of contraception								
Ever	567	84.4	59.8	1.00	82.6	1.00	73.1	1.00
Never	105	15.6	40.2	3.57(2.17–5.88)	17.4	1.14(0.65–1.96)	26.9	2.00(1.35–2.94)
Number of living children								
≤ 1	447	66.5	62.1	1.00	3.3	1.00	27.9	1.00
2	145	21.6	29.9	1.48(0.89–2.45)	26.5	24.66(8.57–70.85)	27.9	3.08(2.05–4.64)
3	58	8.6	3.4	0.43(0.13–1.41)	28.9	67.44(23.12–196.46)	18.3	5.05(3.08–8.25)
4	14	2.1	3.4	1.77(0.49–6.37)	21.5	207.54(63.78–674.54)	13.9	15.96(7.97–31.95)
5–8	8	1.2	1.2	1.03(0.13–8.34)	19.8	335.25(94.25–1191.21)	12.0	24.08(10.37–55.88)
Sex of living children	(n = 439)		(n = 82)		(n = 120)		(n = 202)	
Boys	156	35.5	40.2		12.5		23.8	
Girls	158	36.0	39.0	0.66(0.36–1.20)	13.3	7.21(4.46–11.72)	23.8	2.77(1.94–3.98)
Both	125	28.5	20.7	1.00	74.2	1.00	52.4	1.00

Table 4 **Independent predictors of unintended pregnancy**

Independent predictors	Adjusted OR	95% CI
Independent predictors of unintended pregnancy		
Woman's age at conception (less than 30 years[a])	2.099	1.28–3.44
Husband's age at conception (less than 40 years[a])	2.070	1.26–3.43
Woman's work status (working[a])	1.798	1.19–2.78
Never use of contraception (ever[a])	2.309	1.52–3.45
Number of living children (≤ 2[a])	1.912	1.16–3.15
Sex of living children (both boys & girls[a])	2.182	1.43–3.32
Model sensitivity = 80.05%		
Independent predictors of unwanted pregnancy		
Woman's age at conception (less than 30 years[a])	2.472	1.33–4.58
Husband's age at conception (less than 40 years[a])	2.359	1.28–4.34
Husbands' education (university graduates[a])	1.881	1.06–3.33
Number of living children (≤ 3[a])	3.671	2.05–6.58
Sex of living children (both boys & girls[a])	3.962	2.29–6.85
Model sensitivity = 87.97%		
Independent predictors of mistimed pregnancy		
Woman's work status (working[a])	1.901	2.27–5.88
Never use of contraception (ever[a])	3.663	1.08–5.88
Model sensitivity = 88.49%		

[a]*Reference category.*

ed with an excess risk of late-seeking antenatal care. However, women whose pregnancy was unintended paid at least four fewer visits relative to those who planned their pregnancy. Such excess risk was observed among those who mistimed their pregnancy, but not among those whose pregnancy was unwanted. Unintended pregnancy was not associated with an excess risk of complications during pregnancy or delivery. Nor was it associated with an excess risk of assisted or operative delivery.

Table 6 shows that unintended pregnancy was not associated with an excess risk of pre-term delivery or low birth weight. However, the risk of low birth weight was significantly higher among infants resulting from mistimed pregnancy. This risk remained even after controlling for the timing of delivery. Although a higher percentage of infants resulting from unintended pregnancy had never been subjected to growth monitoring, nor to periodic health evaluation, no excess risk was observed in this respect. Moreover, the great majority of infants resulting from unintended pregnancy, and those resulting from planned pregnancy, were breastfed. No significant difference was observed in terms of the time of initiation of breastfeeding (Table 6).

The immunization status of infants was obtained from the birth certificate in 82.5% of cases, and from the mother in 17.5% of cases (Table 7). An almost equal percentage of infants resulting from planned pregnancies as those resulting from unintended pregnancies were immunized against the seven vaccine-preventable diseases.

Table 5 **Pregnancy intention status in relation to maternity care**

Maternity care characteristic	Intended (*n* = 672)		Unintended				Total unintended (*n* = 208)	
			Mistimed (*n* = 87)		Unwanted (*n* = 121)			
	No.	%	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Antenatal care[a]								
No	46	6.8	8.0	1.00	18.2	1.00	13.9	1.00
Yes	626	93.2	92.0	1.72(0.51–2.69)	81.8	2.79(1.60–4.84)	86.1	2.08(1.26–3.43)
Tetanus toxoid[a]								
Received	565	84.1	81.6	1.00	70.2	1.00	75.0	1.00
Not received	107	15.9	18.4	1.21(0.67–2.17)	29.8	2.42(1.55–3.79)	25.0	1.85(1.26–2.70)
Start of antenatal care[a]	(*n* = 626)		(*n* = 80)		(*n* = 99)		(*n* = 179)	
During first trimester	459	73.3	67.5	1.00	72.7	1.00	70.4	1.00
After first trimester	167	26.7	32.5	1.32(0.79–2.18)	27.3	0.95(0.59–1.54)	29.6	1.11(0.76–1.60)
Frequency of antenatal care[a]	(*n* = 26)		(*n* = 80)		(*n* = 99)		(*n* = 179)	
5+ visits	406	64.9	52.5	1.00	58.6	1.00	55.9	1.00
≤ 4 visits	220	35.1	47.5	1.67(1.04–2.69)	41.4	1.21(0.79–1.88)	44.1	1.39(1.00–1.97)
Problems during pregnancy								
No	637	94.8	90.8	1.00	95.9	1.00	93.8	1.00
Yes	35	5.2	9.2	1.84(0.82–4.11)	4.1	0.78(0.30–2.04)	6.3	1.21(0.63–2.34)
Type of delivery								
Normal	568	84.5	89.7	1.00	88.4	1.00	88.9	1.00
Assisted or caesarean	104	15.5	10.3	0.63(0.31–1.29)	11.6	0.71(0.39–1.29)	11.1	0.68(0.42–1.09)
Problems during delivery								
No	634	94.3	97.7	1.00	91.7	1.00	94.2	1.00
Yes	38	5.7	2.3	0.39(0.09–1.66)	8.3	1.50(0.73–3.10)	5.8	1.02(0.52–1.99)

[a] *Risk adjusted for mothers' level of education.*

Table 6 **Pregnancy intention status in relation to infant health and care**

Infant health and care	Intended (n = 672)		Unintended				Total unintended (n = 208)	
			Mistimed (n = 87)		Unwanted (n = 121)			
	No.	%	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Time of delivery								
Full term	638	94.9	93.1	1.00	96.7	1.00	95.2	1.00
Pre-term	34	5.1	6.9	1.39(0.51–3.60)	3.3	0.64(0.19–1.94)	4.8	0.95(0.43–2.04)
Infant weight at birth (g)								
> 2500	615	91.5	81.6	1.00	93.4	1.00	88.5	1.00
≤ 2500	57	8.5	18.4	2.43(1.32–4.62)	6.6	0.76(0.33–1.72)	11.5	1.41(0.82–2.39)
Growth monitoring								
Ever	479	71.3	64.4	1.00	66.1	1.00	65.4	1.00
Never	193	28.7	35.6	0.73(0.44–1.20)	33.9	0.79(0.51–1.21)	34.6	0.76(0.54–1.07)
Regular health evaluation								
Yes	234	34.9	35.6	1.00	30.6	1.00	32.7	1.00
No	438	65.1	64.4	1.04(0.63–1.69)	69.4	0.82(0.53–1.28)	67.3	0.91(0.64–1.28)
Breastfeeding								
Ever	654	97.3	98.8	1.00	98.3	1.00	98.6	1.00
Never	18	2.7	1.2	0.42(0.02–3.05)	1.7	0.61(0.10–2.78)	1.4	0.35(0.06–1.60)
Time of initiation of breastfeeding	(n = 654)		(n = 86)		(n = 119)		(n = 205)	
≤ 1 hour	315	48.2	46.5	1.00	43.7	1.00	44.9	1.00
> 1 hour	339	51.8	53.5	1.07(0.67–1.72)	56.3	1.20(0.79–1.81)	55.1	1.14(0.82–1.58)

Table 7 **Pregnancy intention status in relation to infant immunization**

Immunization status	Intended (n = 672)		Unintended				Total unintended (n = 208)		OR (95% CI)
			Mistimed (n = 87)		Unwanted (n = 121)				
	No.	%	No.	%	No.	%	No.	%	
BCG	672	94.5	87	94.3	121	90.1	208	91.8	0.65 (0.35–1.24)
Polio vaccine									
First dose	658	97.7	81	97.5	118	95.8	199	96.5	0.64 (0.24–1.76)
Second dose	625	84.9	75	90.7	115	79.1	190	83.7	0.91 (0.57–1.45)
Third dose	590	75.6	69	81.2	112	68.8	181	73.5	0.89 (0.60–1.33)
DPT vaccine									
First dose	658	92.1	81	92.6	118	87.3	199	89.4	0.73 (0.41–1.28)
Second dose	625	76.9	75	86.7	115	72.1	190	77.9	1.05 (0.70–1.59)
Third dose	590	64.9	69	79.7	112	57.1	181	65.7	1.04 (0.72–1.50)
HBV									
First dose	658	77.6	81	85.2	118	71.2	199	76.9	0.96 (0.65–1.42)
Second dose	625	62.9	75	77.3	115	60.9	190	67.3	1.22 (0.85–1.74)
Third dose	590	56.8	69	72.5	112	50.0	181	58.6	1.08 (0.76–1.53)
Measles	549	92.3	60	95.0	110	90.9	170	92.4	1.00 (0.50–2.02)

No. represents children who are eligible for the vaccine according to their age.
% represents the proportion of immunized children.

Discussion

It has been estimated that, globally, one-quarter of births each year are unintended [*16*]. However, this rate varies from one community to another, according to the characteristics of the surveyed population. In the United States of America [*17*] and the United Kingdom [*18*], nearly one-third of births result from unintended pregnancy. A much higher rate, exceeding 40%, has been reported from Canada [*19*], Latin America [*14*] and South Africa [*20*], where unmarried and cohabiting women were surveyed. In our community, the rate of births resulting from unintended pregnancy was much lower than those figures. Our figures, however, are comparable to those previously reported by an extensive survey conducted in five governorates in Upper Egypt, including the Beheira governorate [*21*]. A much lower rate of 10% was observed among squatter dwellers in Alexandria, where a large proportion of married women below the age of 20 years were enrolled [*22*].

In the surveyed community, women whose last birth resulted from an unintended pregnancy formed two distinct categories: women whose most recent birth resulted from mistimed pregnancy, reflecting a need for spacing; and women whose most recent birth resulted from an unwanted pregnancy, reflecting a need for fertility limitation. This, as well as previous surveys, [*3,21,22*] emphasizes that the majority of births resulting from unintended pregnancy are unwanted, reflecting a stronger need for fertility limitation. Furthermore, the rate of births resulting from unwanted pregnancy may well be under-

estimated, as women may be reluctant to acknowledge that the child was unwanted.

A 1998 study by Henshaw [*17*] pointed to the fact that women who have a child as a result of an unintended pregnancy are more likely to give a history of abortion. Among our study population, the rate of abortion did not vary with the pregnancy intention status. Yet women whose most recent birth resulted from an unintended pregnancy were more likely to report a history of miscarriage. Since abortion is neither socially acceptable nor legal, the possibility that these women might deny having an abortion, preferring to give a more socially acceptable answer, cannot be ignored.

Cultural and social factors play an important role in shaping women's attitudes towards family size and preferred sex. In Egyptian society, boys are highly valued and the lack of a boy in the family encourages further pregnancies [*23*]. Nevertheless, families strive to have both sons and daughters. This explains the higher risk of unwanted birth among women who had surviving sons and daughters. However, previous studies [*3,22*] have demonstrated that Egyptian women, as in Western societies [*20*], now tend to value fewer children. This explains the observed births resulting from unintended pregnancy (mainly unwanted ones) among couples in the older age group who had reached their desired family size. Previous studies have shown that among married women, the odds of unwanted pregnancy increase with higher maternal age [*14,24*].

Couples with high educational attainment are usually more career oriented and strive for a better quality of life. These couples tend to value a small family size, with few children; pregnancies above their preferred number are likely to be unwanted. Moreover, working women are less likely to have an unintended pregnancy, particularly a mistimed one, as they have an ambition to pursue a career, and fear being threatened by the demands of caring for a new child [*20*]. In an extended family, the responsibility and care of a new child is assumed by all members. This could explain why fewer pregnancies were unwanted among women living in joint and extended families.

A high proportion of women enrolled in our study reported using contraception, reflecting their awareness that pregnancy can be avoided when it is not wanted. This is certainly the reason that the most recent birth of these women was less likely to be the result of an unintended pregnancy. In fact, never users of any contraceptive method were those aged less than 30 years, who had not yet reached their desired number of children. These women probably fear that the early use of contraceptives may adversely affect their fertility. A survey of squatter-dwellers in Alexandria revealed that the majority of married women under 20 years of age had never used contraception [*22*].

It has been emphasized that women with unintended pregnancy were not using any contraceptive method during the month they become pregnant [*17,25*], or they were irregular in doing so [*25*]. Although they did not want to become pregnant, nearly half of the women whose recent birth resulted from an unintended pregnancy were not using any contraceptive method, reflecting 'unmet needs' for family planning [*4*]. Indeed, 11.1% of the women surveyed have an unmet need for family planning. Contraceptive failure was also responsible for a proportion of unintended pregnancies, in agreement with other studies [*17,20–22*] where this can reach as high as 48% [*17*]. As no contraceptive is 100% effective [*5*], some unintended preg-

nancies will inevitably result, regardless of the degree to which contraceptive use is increased [*16*].

The study by Sable and Wilkinson [*26*] highlighted the adverse effects of unintended pregnancy on the health and welfare of the mother and child as a result of the inadequate care that stems from a woman's attitude toward her pregnancy. In our sample, even after controlling for the confounding effect of education, unwanted pregnancy was an obstacle to seeking antenatal care and receiving at least one dose of the tetanus toxoid. Several studies have pointed out that unwanted pregnancy is a barrier to seeking antenatal care [*6,7*] or starting it early [*6–10*]. It is important to note that women in this study whose most recent birth resulted from an unwanted pregnancy were multiparous, with a long experience of childbearing. These women probably believe that they are capable of monitoring their own pregnancy, as multiparous women generally tend to place less emphasis on prenatal care [*8*]. However, if a pregnancy is rejected, it becomes less likely to be considered deserving of care. For those who sought antenatal care, pregnancy intention status did not affect the time of starting antenatal care.

A number of studies have shown that during an unwanted pregnancy, the mother's behaviour increases the risk of premature birth [*12*] and of low birth weight [*11*], and the child is also less likely to be breastfed [*13*]. However, other studies have demonstrated the converse: that these infants are neither at higher risk of premature delivery [*14*], nor of low birth weight [*15,16*], nor are they less likely to receive well-baby care [*13*], if family background is considered. Among the women surveyed here, recent births that resulted from an unintended pregnancy were not associated with preterm delivery. This is likely to be because the at-risk behaviours, such as smoking and substance abuse, reported by Orr et al. [*12*] are extremely rare, or nonexistent, in Egyptian society—especially so in the community surveyed. The low birth weight associated with mistimed pregnancy cannot be attributed to pregnancy intention status. These infants were born to young mothers of low parity, a likely contributor to their low birth weight.

Generally, pregnancy intention status did not have had an adverse effect on infant care, including breastfeeding, well-baby care, or immunization. This reflects the prevailing cultural and social values whereby the mother puts aside her own individual interests or needs to take full responsibility for the child and its attendant needs. However, adverse effects of unintended pregnancy on the child cannot be ruled out, as it is always possible that a certain proportion of births resulting from unintended pregnancy were not able to survive, and hence, were not included in this survey. A recent survey has indicated that Egyptian children who are the result of unplanned pregnancies do not suffer a lack of care but at the same time the same survey reported that 6% of such infants die before their first birthday [*27*].

Our study highlighted the extent of births resulting from unintended pregnancy in a community encompassing both rural and urban populations. A woman's age, the number of children she already has, and the children's sex strongly determine her pregnancy intention, reflecting a need for either spacing or fertility limitation. Unfortunately, nearly half of those who had a recent birth resulting from an unintended pregnancy were not using any contraceptives, and more than one-tenth had an 'unmet need' for family planning.

Unintended pregnancy is not simply the result of contraceptive failure or the lack of

access to family planning, but reflects the inability of family planning programmes to respond fully to client needs [5]. Family planning programmes should consider assisting women in determining their fertility goals—both in terms of number and timing of children—and advise on the most appropriate means of achieving those goals. Health visitors should ensure they are able to reach women who are reluctant to seek care of their pregnancies, and motivate them to do so. Effective family planning programmes should meet the needs of all women during their whole reproductive span. National programmes should be directed to improving women's status and encouraging their employment, as these women will be able to recognize the threat of an unwanted or mistimed child, and adopt behaviours aimed at prevention conception.

While pregnancy intention status did not have adverse effects either on the mother or on the pregnancy outcome, the true extent of adverse effects cannot easily be determined. It is likely that unintended pregnancies ending in a stillbirth or termination were missed in this survey. Further research is needed to explore the scope of unintended pregnancy and its outcome, as well as women's knowledge of the existence of emergency contraceptives. Further research is also required to determine the reasons for unmet family planning needs, and to explore the means of satisfying those needs.

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