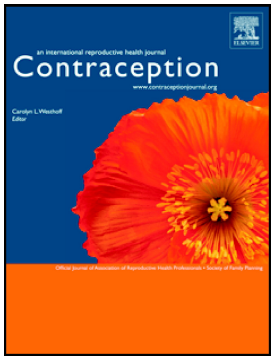

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Sara Adelman, Chris Smith, Caroline Free

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Predictors of Post-abortion Contraception Use in Cambodia

Authors: Sara Adelman[1] Chris Smith[1] Caroline Free[1]

[1] London School of Hygiene and Tropical Medicine

Corresponding author: Sara Adelman sara.elan.adelman@gmail.com

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Abstract

Objective

To evaluate which characteristics collected at the point of abortion are associated with contraceptive use over the extended post-abortion period for women in Cambodia.

Methods

The study includes a cohort of 500 women who attended a Marie Stopes International Cambodia clinic for an induced abortion. The primary outcomes are use of effective contraception ≥80% of the time over the four and 12-month period post-abortion. We conducted a bivariate analysis to assess the association between each characteristic and the outcome, followed by multivariable modelling to identify the strongest predictors of the outcomes.

Results

Nearly 44% of the women used contraception for more than 80% of the time during both follow-up periods. Several socio-demographic and reproductive factors were crudely associated with the outcomes. In the multivariable model, prior use of contraception, intention to use post-abortion contraception, increased number of children and medical abortion were associated with increased contraceptive use over the year post-abortion. Occupation was a predictor at four months only, and abortion method at 12 months only.

Conclusions

The models were satisfactory in predicting the outcome of contraceptive continuation both at four and 12 months. The paper sets out a methodology for modelling these predictors that can help inform more client-centred counselling and services for women.

Implications: Factors known when attending a clinic for induced abortion can help inform more targeted and client-centred post-abortion family planning counselling and services for women in Cambodia.

Introduction

Post-abortion care (PAC) is a comprehensive strategy to support women after an abortion, whether safe or unsafe. PAC services historically focused on reducing maternal mortality by treating complications from unsafe abortions rather than addressing women's unmet need for family planning.(1) Now many PAC programs incorporate contraceptive counselling and services as an intervention to tackle the cycle of repeat unintended pregnancy and abortion.(2) While abortion is legal in Cambodia, women continue to face barriers to obtaining safe procedures and many health facilities lack comprehensive PAC services.(3)

Amongst the post-abortion contraception literature, most studies focus on the effectiveness of interventions to improve contraceptive uptake whereas few aim to identify independent predictors or patterns of post-abortion contraception use.(4–7) Further, the majority of outcomes measure contraceptive acceptance or uptake immediately after the abortion; only four of 15 studies included in a systematic review of post-abortion contraception include follow up beyond one month.(4) As such, little is known about women's practices in the extended period following the abortion, including patterns of contraceptive uptake, switching, continuation, and discontinuation as well as repeat abortion and repeat pregnancy.(4)

Existing studies on post-abortion contraceptive predictors in the extended period have been conducted in Bangladesh(8), Sweden(9) and Zimbabwe(10), but yielded varying results, due to differences in the study populations, study designs, and outcomes of interest. Of the two prior studies examining predictors of post-abortion contraception in Cambodia, both focus exclusively on immediate uptake of contraception. McDougall and colleagues found that after controlling for all variables, only facility characteristics remained associated with the outcome of contraceptive acceptance.(11) Whereas Delvaux and colleagues found women who used contraception post-abortion were more likely to be older, married, have one child and have used contraception before.(12)

This paper aims to assess the individual factors associated with continued use of post-abortion contraception at four and 12 months within the sample population of a randomised controlled trial in Cambodia.

Methods

This study involves secondary data analysis of 2014 data from a single-blind randomised-controlled trial (RCT) conducted in Cambodia. In brief, the MObile Technology for Improved Family Planning (MOTIF) trial assessed whether an additional intervention delivered by mobile phone improved the use of post-abortion contraception. The intervention development and trial results are described elsewhere.(13)

The study recruited five hundred women who attended one of four Marie Stopes International Cambodia (MSIC) clinics covering both urban and rural areas in Cambodia for an induced abortion (potentially including care for incomplete or complications of abortions). Local research assistants (RAs) administered three questionnaires to participants: one baseline survey conducted in person after receiving counselling at the clinic and two follow-up phone-based surveys at four and 12 months to inquire about the trial outcomes.

The primary outcome is continued use of effective contraception over the four-month and 12 month period post-abortion. Effective methods include the oral contraceptive pill (OCP), implant, intra-uterine device (IUD) or injectable. We created a binary outcome from women's self-reported retrospective data on their contraceptive use, captured weekly up to four months and monthly up to 12 months. We chose to define continuation as 80% contraceptive use over these time periods, as it was pre-specified variable in the main study. This allowed women who started on contraception at a follow up visit to be counted as contraceptive users. While an alternative option to use 100% use was considered, it was not used given only half as many women used contraception for 100% than 80% in the post-abortion periods.

In this paper we analyse baseline characteristics collected when women were attending the clinic for induced abortion as potential predictors of the outcomes. Socio-demographic factors included: women's age, literacy, language, socio-economic status (using access to motorised transport as a proxy measure), residence, education, marital status, and occupation. Reproductive health factors included: number of living children, number of previous abortions, abortion method, pressure to have an abortion, previous contraceptive use, contraception intention, fertility intention, and contraceptive decision-making process.

To assess the distribution of the characteristics across the entire cohort, we conducted a descriptive analysis at baseline, four months, and 12 months. Next, we examined the

association between the 14 independent variables and the outcomes with an exploratory bivariate analysis. Third, we used predictive modelling with logistic regression to develop a parsimonious multivariable model for the outcomes, utilizing a backwards-stepwise elimination approach in the selection of variables. Decisions to include variables in the final model were based on statistical significance where non-significant variables were removed from the model at the cut-off of p=0.157.(14) Starting with a full model of 12 baseline characteristics, we removed the variable least associated to the outcome from the model. A Likelihood Ratio Test compared the two models to the data and determined the best-fit model with the strongest predictors.

Results

At four months, 431 women remained in the study with 13.8% lost to follow-up; at 12 months, 328 women remained with 34.4% lost to follow-up. The summary statistics revealed no important variations in the cohort across baseline to follow-ups. At baseline, 48% of women were between 26-35 years old; 61% of women had a secondary level education or above; and, 20.4% reported being self-employed, followed by 20% reported being housewives and smaller 5% working in entertainment). More than half the women (60%) reported no abortions prior to the index abortion, one quarter of the women reported having one prior, and 15% reported two or more. While the majority of women (60%) reported previously using contraception, intention to use contraception post-abortion was mixed. At the time of abortion, 54% of the women reported being undecided while 37% reported they intend to use contraception.

Related to the outcome, nearly half of the women continued on effective contraception for 80% of the post-abortion periods: 189 (43.8%) women at four months and 147 (44.8%) women at 12 months. Further, Table 1 presents the results from the bivariate analysis for the outcome at four and 12 months. The following factors suggest association with 80% continued contraception use over four months: women aged 26 to 35 compared to women below 25 (OR=2.03, 95%CI=1.32-3.12); women who resided in a rural area compared to urban (OR=1.59, 95%CI=1.05-2.40); married or cohabitating women compared to never married (OR=3.83, 95%CI=1.26-11.68); women who worked in entertainment when compared to housewives (OR=0.21, 95%CI=0.06-0.67); women with one to two or three children compared to those with none (OR=4.41, 95%CI=2.64-7.36 and OR=3.46, 95%CI=1.88-6.37, respectively); women who underwent a surgical abortion compared to medical (OR=1.86, 95% CI=1.24-2.78); women who intended to

use contraception compared to those who do not (OR=7.89, 95% CI=2.99-20.83); and women who were undecided about their fertility plans compared to women who intended to have another child (OR= 2.76, 95%CI=1.38-5.52)

The following factors suggest association with 80% continued contraception over 12 months: women age 26 to 35 compared to women below 25 (OR=2.21, 95%CI=1.36-3.59); married or cohabitating women compared to never married (OR=13.44, 95%CI=1.75-102.97; wide interval due to no women in divorced stratum); women with one or two children compared to those with none (OR=5.12, 95%CI=2.77-9.49); and women who intend to use contraception compared to those who do not (OR=3.32, 95%CI=1.35-8.20).

The final model for 80% contraceptive continuation over four months had a Wald p-value of <0.001 and included the variables detailed in Table 2. The final model for 80% contraceptive continuation over 12 months had a Wald p-value of <0.001 and included the variables detailed in Table 3. All variables were adjusted for the other variables in the model.

The two models share a number of predictors, including previous contraception use. When compared to women with prior use, results show strong evidence that women who reported no prior contraception use had around half the odds of continuing on an effective contraceptive method for at least 80% of the four and 12 months (OR=0.40, 95%CI=0.24-0.68 and OR=0.51, 95%CI=0.30-0.80, respectively). Intention to use contraception was included in both models (OR=4.60, 95%CI=1.55-13.64). The results also suggest strong evidence that women with more children were associated with increased odds of the outcome at both four and 12 months. Women with one or two children had the highest odds of the outcome at four months (OR=2.58, 95%CI=1.38-4.81), while women with three or more children had the higher odds of 80% contraceptive use over 12 months (OR=5.22, 95%CI=2.31-11.76).

Occupation and abortion method were found to be predictors in one of the two models. At four months, women working in entertainment were 80% less likely to have the outcome (OR=0.22, 95%CI=0.06-0.85). At 12 months, women who had surgical abortion compared to medical abortion were less likely to continue contraception for 80% of the year post-abortion (OR=0.57, 95%CI=0.34-0.96).

Discussion

The results from this analysis suggest that several socio-demographic and reproductive health factors were associated with contraceptive use and continuation following an abortion. The strong predictors in both models included previous contraceptive use, intention to use contraception and number of living children; occupation was only a strong predictor at 4 months and abortion method was a predictor at 12 months post-abortion.

To our knowledge, this study is the second in Cambodia with a primary focus to examine predictors of contraceptive use for post-abortion women, but the first to look at the extended period through 12 months. This is a key strength as it more accurately captures contraceptive coverage over the extended post-abortion period. While many consider RCTs to be the “gold standard” in research, there are rich opportunities to reuse RCT data for observational analyses to answer new questions.(27) We repurposed the dataset from the MOTIF RCT as a prospective, descriptive longitudinal study by creating a single cohort, controlling for the intervention and using the baseline characteristics as the primary exposures.

Moreover, comparing the study participants to the wider client base seeking abortion services at the four MSIC clinics in 2013, we found that baseline characteristics were relatively similar. Additionally, the sample demographics aligned with background statistics in the Cambodia Demographic Health Surveys(16) for women who have had at least one abortion, suggesting broader representativeness. Results may cautiously be generalizable within similar settings and facilities in Cambodia.

Despite these strengths, our study has several limitations. A limitation of using a cut off of 80% for continuous contraceptive use is that even women using contraception for 80% of the time experienced a risk of pregnancy if sexually active during the time they were not using contraception. Additionally there might be important differences between women continuing for 80% versus 100% of the post-abortion periods. Moreover, the outcome was created based on self-reported measures; while commonly used in sexual health research, they may be subject to recall and social desirability bias.(28) Further, the study requested that women report contraceptive use retrospectively over several months, which could result in additional recall bias.(29) Another limitation is the 34.4% lost to follow-up rate over 12-months. However, this is lower than dropout rates experienced by similar cohort studies examining 12-month

contraceptive adherence (41% in a Tanzanian study(30) and 45.5% in a Zimbabwean study(10)).

While women with one to two children had the highest odds of continuing effective contraception at 4 months post-abortion, women with three or more had the highest odds of continuing effective contraception over 12 months. Number of children is known to be a strong independent predictor of modern contraceptive use(15), as women closer to achieving their desired family size are more likely to use contraceptive methods continuously to reduce the chance of pregnancy. This trend reflects the desired family size in Cambodia, reported as three children.(16)

In the multivariable analysis, medical abortion was associated with higher odds of effective contraception use compared to surgical abortion, which had a stronger association in the univariate analysis. This finding is likely due to confounding factors such as age and parity. This result is surprising given existing research on the topic that suggests that women who undergo surgical abortions are more likely to be fitted with IUDs and thus have continued protection (17) or that abortion method has no bearing on contraceptive uptake and continuation.(18) In our study there was no crude association between IUD use and surgical abortion. Further, our data did not differentiate between induced abortions and treatment of spontaneous abortions within the category of surgical procedures; hence, one possibility is that the groups of women undergoing surgical versus medical abortions are different. Further research into abortion method and contraceptive uptake in this context could be warranted.

The association between women's past use of effective contraception and post-abortion contraceptive continuation is consistent with studies from Pakistan, Nepal and Bangladesh(8,19–21). However, the study by McDougall and colleagues in Cambodia found no such association,(11) likely due to differences in measurement: prior contraceptive use was captured only at the point of conception (not any past use) and their outcome was focused on immediate post-abortion contraceptive acceptance.

Contraceptive intention was the strongest predictor of continuation in the four-month period post-abortion. More than half the women in the study were undecided on their intention and it is the only variable potentially amendable to intervention. Existing research shows a positive relationship between contraception counselling and contraceptive intention(4,8), but it is unclear

whether enhanced counselling, in addition to standard counselling that all women received, could address specific concerns and increase contraception use amongst women undecided or not planning to use contraception in Cambodia. While many factors including partner approval, social norms and past use are known influencers of contraceptive intention(22), we recommend further exploring intention to contracept in the context of post-abortion in this setting.

The association between women in the entertainment industry and low contraception continuation accords with literature in Southeast Asia documenting barriers to access and pervasive stigma around reproductive health services for this population.(23–26) Our analysis also found this population reported the highest number of prior abortions in the study. Therefore a targeted, innovative approach to post-abortion contraceptive counselling and services should be explored for entertainment workers in Cambodia to help reduce barriers and better meet their fertility needs.

Our findings suggest there is an opportunity for service providers to flag women who might benefit from additional support in post-abortion contraceptive counselling and services – those more likely to not continue on effective contraception. Further research should explore why some women are undecided and do not form intentions to use contraception post-abortion. Counselling may be opportunity to address concerns and misconceptions about contraception, or undecided women could be contacted for follow up at a later date. This work could form the basis for designing and further evaluation of interventions designed to increase post-abortion contraception use.

Conclusion

This research adds to a growing body of research on predicting characteristics for post-abortion contraception and contributes to the limited literature on the topic in Cambodia. For post-abortion care programs that collect information at the point of abortion, the methodology set out in this paper can help identify strong predictors of contraceptive use and suggest women who might benefit from additional support to achieve their desired fertility outcomes.

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Table 1. Association of baseline characteristics with 80% continued use of effective contraception by women in Cambodia followed up at 4 months and 12 months post-abortion

Variable		**4 months** (n=431)			**12 months** (n=328)		
		80% Cont'd Use n=189	**Crude OR** (95% CI)	**P-value**	**80% Cont'd Use** n=147	**Crude OR** (95% CI)	**P-value**
Age	<25	54 (34%)	1.00		39 (34%)	1.00	
	26-35	113 (51%)	2.03 (1.32-3.12)	0.0215	94 (53%)	2.21 (1.36-3.59)	0.0376
	>36	22 (43%)	1.52 (0.78-2.94)		14 (41%)	1.38 (0.63-3.03)	
SES	Access to motorised transport	171 (45%)	1.00		133 (45%)	1.00	
	No access to motorised transport	18 (36%)	0.62 (0.34-1.15)	0.1256	14 (41%)	0.85 (0.41-1.74)	0.6512
Residence	Urban	57 (38%)	1.00		44 (38%)	1.00	
	Rural	132 (47%)	1.59 (1.05-2.40)	0.0278	103 (49%)	1.55 (0.97-2.45)	0.0627
Education	Secondary or above	114 (43%)	1.00		92 (44%)	1.00	
	None or primary	75 (45%)	1.00 (0.67-1.49)	0.9939	55 (46%)	1.09 (0.70-1.72)	0.7003
Marital Status	Never married or cohabitating	4 (17%)	1.00		1 (6%)	1.00	
	Married/cohabitating	185 (46%)	3.83 (1.26-11.68)	0.2152	146 (47%)	13.44 (1.75-102.97)	0.0193
	Divorced/separated	0 (0%)	-		0 (0%)	-	
Occupation	Housewife	46 (50%)	1.00		34 (49%)	1.00	
	Factory	30 (50%)	0.95 (0.48-1.88)		19 (43%)	0.80 (0.38-1.72)	
	Entertainment	4 (18%)	0.21 (0.06-0.67)		3 (18%)	0.23 (0.06-0.86)	
	Farmer	17 (65%)	2.01 (0.75-5.34)		10 (59%)	1.51 (0.52-4.43)	
	Employed	29 (33%)	0.44 (0.24-0.83)	0.034	27 (40%)	0.70 (0.36-1.37)	0.7403
	Self-employed	60 (48%)	0.87 (0.50-1.53)		50 (52%)	1.15 (0.62-2.13)	
	Casual	1 (33%)	0.41 (0.04-4.73)		2 (67%)	2.12 (0.18-24.44)	
	Student	1 (8%)	0.08 (0.01-0.61)		2 (22%)	0.30 (0.06-1.56)	
	Unemployed	1 (20%)	0.28 (0.03-2.76)		0 (0%)	-	
Number of Living Children	0	27 (23%)	1.00		16 (18%)	1.00	
	1-2	119 (53%)	4.41 (2.64-7.36)	0.0351	97 (54%)	5.12 (2.77-9.49)	<0.001

	3 or more	43 (49%)	3.46 (1.88-6.37)		34 (57%)	5.80 (2.76-12.22)	
Number of Previous Abortions	0	108 (43%)	1.00	0.5032	92 (46%)	1.00	0.4344
	1	53 (46%)	1.16 (0.74-1.83)		38 (46%)	1.02 (0.61-1.71)	
	2 or more	28 (45%)	1.16 (0.65-2.07)		17 (38%)	0.72 (0.37-1.40)	
Abortion Method	Medical	63 (35%)	1.00	0.0025	63 (46%)	1.00	0.4344
	Surgical	126 (50%)	1.86 (1.24-2.78)		84 (44%)	0.94 (0.61-1.47)	
Disclosure of Abortion	Yes	83 (48%)	1.00	0.9613	65 (49%)	1.00	0.7955
	No	15 (47%)	1.02 (0.46-2.25)		10 (53%)	1.18 (0.45-3.09)	
Previous Contraception Use	Yes	142 (53%)	1.00	<0.001	106 (53%)	1.00	<0.001
	No	47 (29%)	0.34 (0.22-0.53)		41 (32%)	0.41 (0.26-0.65)	
Post-abortion Contraceptive Intention	No	6 (19%)	1.00	<0.001	8 (30%)	1.00	<0.001
	Undecided	77 (33%)	1.85 (0.72-4.77)		69 (38%)	1.46 (0.61-3.52)	
	Yes	106 (64%)	7.89 (2.99-20.83)		70 (58%)	3.32 (1.35-8.20)	
Fertility Intention	Have another child	100 (38%)	1.00	0.0012	78 (40%)	1.00	0.0289
	No more/none	62 (50%)	1.56 (1.00-2.42)		47 (52%)	1.67 (1.01-2.76)	
	Undecided	27 (57%)	2.76 (1.38-5.52)		22 (54%)	1.77 (0.90-3.48)	
Contraception Decision Making	Joint decision	109 (42%)	1.00	0.1052	88 (46%)	1.00	0.2894
	Mainly woman	43 (54%)	1.47 (0.88-2.45)		29 (46%)	1.02 (0.58-1.80)	
	Mainly husband/partner	33 (50%)	1.46 (0.83-2.57)		29 (55%)	1.44 (0.78-2.65)	

Table 2. Multivariable model for 80% continued use of contraception by women in Cambodia at 4 months post-abortion

Variable		aOR	(95% CI)	Overall P-value
Previous contraception use	Yes	1.00	-	<0.001
	No	0.40	(0.24-0.68)	
Post-abortion Contraceptive Intention	No	1.00	-	<0.001
	Undecided	0.82	(0.28-2.44)	
	Yes	4.60	(1.55-13.64)	
Number of Living children	0	1.00	-	0.0055
	1-2	2.58	(1.38-4.81)	
	3 or more	1.45	(0.67-3.13)	
Occupation	Housewife	1.00	-	0.0613
	Factory	1.30	(0.59-2.85)	
	Entertainment	0.22	(0.06-0.85)	
	Farmer	1.34	(0.44-4.11)	
	Employed	0.44	(0.21-0.90)	
	Self-employed	0.80	(0.43-1.52)	
	Casual	1.02	(0.08-12.34)	
	Student	0.14	(0.01-1.48)	
	Unemployed	0.49	(0.04-5.79)	

Table 3. Multivariable model for 80% continued use of effective contraception by women in Cambodia at 12 months post-abortion

Variable		aOR	(95% CI)	Overall P-value
Previous contraception use	Yes	1.00	-	0.0106
	No	0.51	(0.30-0.85)	
Post-abortion Contraceptive Intention	No	1.00	-	
	Undecided	0.99	(0.38-2.59)	
	Yes	2.38	0.87-6.46	
Number of Living children	0	1.00	-	<0.0001
	1-2	4.49	(2.33-8.65)	
	3 or more	5.22	(2.31-11.76)	
Abortion Method	Medical	1.00	-	0.036
	Surgical	0.57	(0.34-0.96)	