An Investigation into Factors Associated with Having a Second Child: Three-year Follow up on Parents of a National Representative Birth Cohort in Taiwan

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ABSTRACT

This study aimed to investigate factors that are associated with having second child. We used data from a prospective, nationally representative birth cohort in Taiwan. A total of 10,039 mothers who gave birth to their first baby in 2005 were recruited for analysis. Contingency table and Chi square test were applied to compare differences across categories. We used multiple logistic regression models to identify predictive factors of having a second child. Within a follow-up period of 3 years, 42.5% of the mothers had a second child. Younger at the time of first birth, living in rural area, having higher education, better family income and less financial or time stress were significantly associated with progression to second birth. The probability of having a second child is higher among those whose first child was a daughter. It is crucial to provide child-bearing aged couples with more supportive environment for child-rearing.

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Introduction

Taiwan is one among the countries that have extremely low fertility. The total fertility rate (TFR) in Taiwan remained below replacement level since 1984 and touched a record low of 0.895 in 2010. Taiwan is also one among the countries which have achieved significant progresses for women's status in the past decades. The changes of women's status also increased the difficulties combining work and childcare for married women. The 2008 Women Health and Fertility Survey showed 31.4% of married women had ever changed job or quitted job during childbearing. Working hour for women are roughly the same as men but the hours required for household duties is longer for women[1]. The 2004 Telephone Survey on Young Adult's Attitudes toward Marriage and Child-bearing in Taiwan reported more than 80% of the child bearing aged adults in Taiwan thought 2 or more children is ideal; however, 51% of those who already have one child have no intention to have a second child.

The reasons for delayed child bearing and the decline in large families were observed and documented on macro-level observations. The factors related to individual's decision of having a child are complex and vary from culture to culture. Fertility behavior is considered to be an outcome of various psychological, social and life course forces that influence individuals' perceptions of the choices available to them and the resources they have.[2] Many empirical studies have reported a negative relationship between women's education or employment and fertility.[3] Studies also showed that in low-fertility societies, sex composition of existing children was a predictive factor in progressing to higher-order births.[4]

The primary goal of this study is to investigate the factors that are associated with second birth in Taiwan. The specific questions are:

1. What are the obstacles that might prevent or postpone married couple to have a second child?
2. What are the potential promoters that could have positive effect on progression to second birth?

Method

Study population

We used data of the Taiwan Birth Cohort Study (TBCS) for this analysis. The TBCS is a prospective, nationally representative prospect study initiated in 2003 under the auspices of Taiwan Bureau of Health Promotion. The design of this study was described previously[5]. It comprises a nationally-representative sample of more than 20,000 children born in 2005

(sampling rate: 12.2%). Before the cohort approaches school age, three waves of data collection were completed at ages 6 months, 18 months, and 3 years. Data collection is based on face-to-face interviews with mothers or primary caregivers. The response rate of the baseline survey was 87.8%, then with high follow-up rates of 94.9% and 93.7% among the respondents of the baseline survey for the second and third surveys respectively. All protocols were approved by human subjects committees at the Bureau of Health Promotion. (Taichung, Taiwan) The inclusion criterion of the sample for this analysis was first in birth order and singleton baby. The sample size for this analysis was 10,039 or an effective sample size of 9,168 by excluding those who had incomplete data for multivariable regression analysis.

Variables

The outcome was defined as having a second baby during a follow-up period of 3 years. Characteristics of mother, including age at first birth, education attainment, working status and urbanization of residence or ethnicity were treated as categorical variables. Age at first birth was computed from mother's year of birth and year of giving birth to the birth baby. Perceived financial stress and time stress was measured according to self-report information, then categorized into binary variables.

Statistical Analysis

The analytical framework of this analysis was displayed in Figure 1. The proportions of having a second child were presented in contingency table, with Chi square test for differences among categories. Logistic regression modeling was applied for multiple adjustment analysis and estimation of odd ratios. All statistic tests were two-tailed and $p<0.05$ was considered statistical significant. Analyzes were performed with SAS version 9.1.3 (SAS Institute, Cary, NC).

RESULTS

Table 1 shows the characteristics of the mothers. 52.2% of their first birth order singleton babies were boy. 49.6% lived in cities and 60.4% were employed at baseline survey. 27.1% and 23.2% lived in urban town and rural town. More than one out of ten were foreign-born mothers. Half of them had college or higher education. 41.2% of the mothers had their first baby at age 26 to 30. 41.2% of them had monthly family income less than 50,000 NT dollars (equitant to 1,700 US dollars).

The univariate analysis in Table 2 showed the proportions of having second child is significantly higher among mothers whose first child was a daughter. Those who lived in

rural area, originally from Taiwan in ethnicity, had higher education, younger at the time of first birth, or had higher family income also had higher proportion of having a second child. Compared with mothers without perceived financial, time, and mental stress, those who had these kinds of stress were less likely to have a second child within 3 years after the first birth. As for experience with first baby, the proportions of having a second child were not correlated with health status of the first child but were lower among those used assisted reproduction technology to have the first baby and those had postpartum depression after giving birth to the first baby. Availability of a timely helper or social and emotional support was associated with higher proportion of having a second child. No significant differences were observed between those who had or had no competing demands of child care and elder care in the family.

Table 3 describes the multiple adjusted odds ratios of having a second child during 3 years of follow-up. After adjustment for other covariates, mothers whose first child was a daughter had higher probability of having a second child (OR=1.11, 95%CI: 1.02-1.22). In comparison with those lived in rural town, mothers lived in city or urban town were less likely to have second child (OR=0.67, 95%CI: 0.60-0.75 and OR=0.74, 95%CI: 0.66-0.83, respectively). Those who were originally from Taiwan in ethnicity were more likely to have second child (OR=1.30, %CI: 1.10-1.53). Younger at the time of first birth, higher education or higher family income were positively associated with likelihood of having second child during the observed 3 years. After controlling for other factors, having mental stress at child rearing was not significantly associated with progression to second birth. Those who had no childrearing-related financial stress or time stress had significantly higher probabilities of having a second child.

DISCUSSTION

In this paper, we used empirical data from a prospective, nationally representative birth cohort in Taiwan to investigate factors associated with having second child. The limitation of this preliminary analysis is short follow-up period of time; however, the data of the forth wave survey, which conducted at the child's age of 5 years, will soon be available for analysis. Also in the survey data, the time of second birth was not collected but may be done retrospectively in the following wave of survey without expected recall bias. Younger at the time of first birth, living in rural area, having higher education, better family income and less financial or time stress were significantly associated with progression to second birth. Though the attitude of wanting a son to continue family line is not as prevailing as it was in the past, the probability of having a second child is higher among those whose first

child was a daughter.

From the stand point of maternal and child health, it's more recommendable for mothers to have all children they want before age 35. If we take spacing into consideration, they had better start before age of 30. The message implicitly conveyed once in pronatalist program in Taiwan was having first child before age 30 and have second child before age of 35. It is crucial to provide child-bearing aged couples with more supportive environment for child-rearing.

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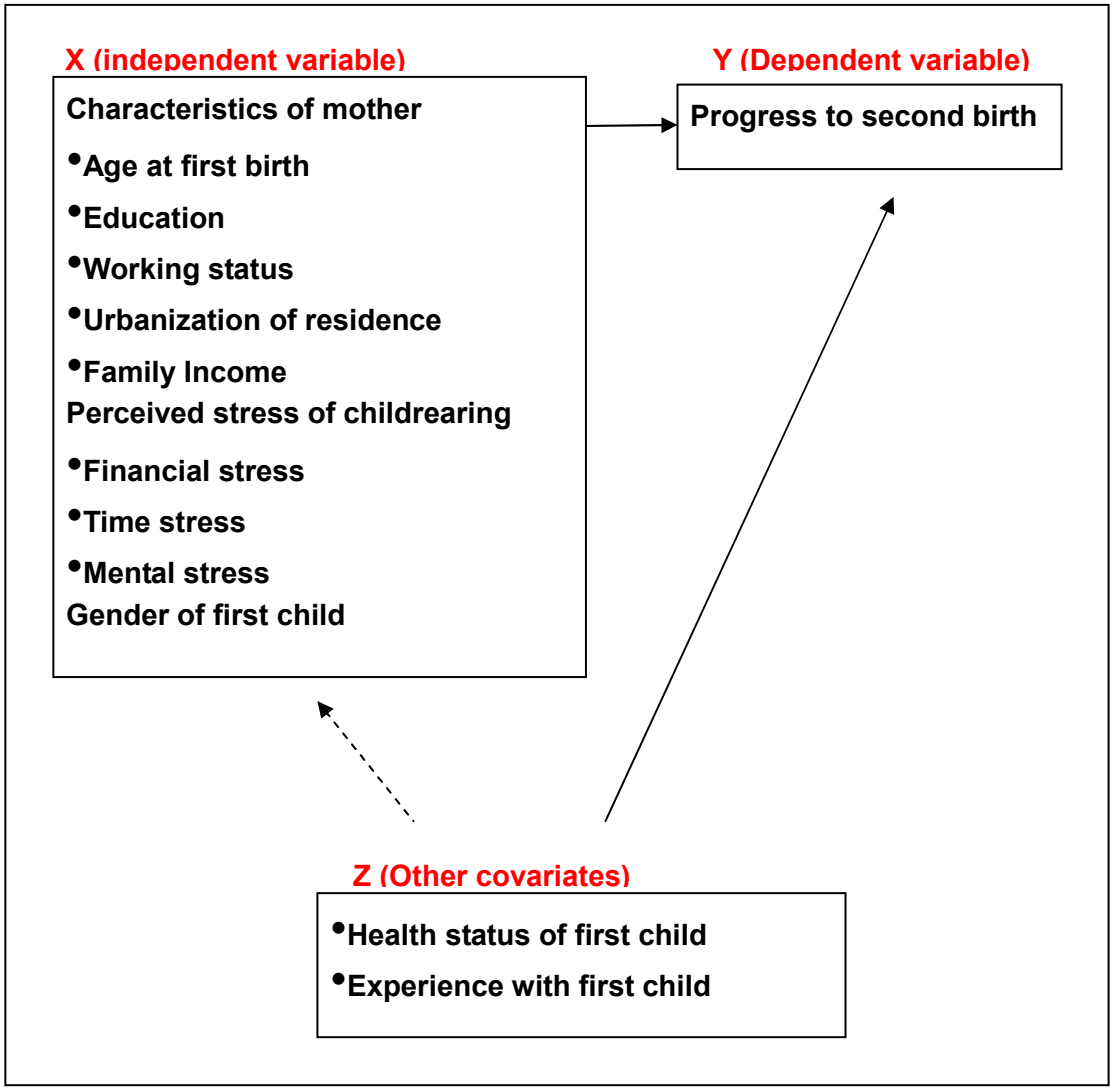

Figure1 Analytical Framework

Table 1. Demographic characteristics of analysis sample

	n	%
Total	10039	100.0
Gender of first child		
Boy	5243	52.2
Girl	4796	47.8
Residence		
City	4974	49.6
Urban town	2718	27.1
Rural town	2328	23.2
Ethnicity		
Mother originally from Taiwan	8553	85.2
Foreign-born mother	1486	14.8
Education		
College or above	5038	50.2
Senior high school	3646	36.4
Junior high school or lower	1344	13.4
Age at first birth		
≧31	2659	26.5
26-30	4134	41.2
≦25	3246	32.3
Working status		
Yes	6064	60.4
No	3975	39.6
Family month income (NTD)		
≧70,000	3259	32.6
50,000-69,999	2627	26.2
≦49,999	4126	41.2

Table 2. The percentage of having a second child during a follow-up of 3 years after first birth

		Having a second child				P-value
		No		Yes		
	N	n	%	n	%	
Total	9168	5268	57.5	3900	42.5	
Gender of first child						0.012
Boy	4780	2806	58.7	1974	41.3	
Girl	4388	2462	56.1	1926	43.9	
Residence						<.0001
City	4513	2739	60.7	1774	39.3	
Urban town	2497	1441	57.7	1056	42.3	
Rural town	2158	1088	50.4	1070	49.6	
Ethnicity						0.0002
Mother originally from Taiwan	7870	4461	56.7	3409	43.3	
Foreign-born mother	1298	807	62.2	491	37.8	
Education						0.0009
College or above	4724	2641	55.9	2083	44.1	
Senior high school	3299	1922	58.3	1377	41.7	
Junior high school or lower	1145	705	61.6	440	38.4	
Age at first birth						<.0001
≧31	2456	1582	64.4	874	35.6	
26-30	3848	2155	56.0	1693	44.0	
≦25	2864	1531	53.5	1333	46.5	
Working status						0.411
Yes	5632	3217	57.1	2415	42.9	
No	3536	2051	58.0	1485	42.0	
Family month income (NTD)						0.550
≧70,000	3041	1728	56.8	1313	43.2	
50,000-69,999	2421	1387	57.3	1034	42.7	
≦49,999	3706	2153	58.1	1553	41.9	
Financial stress						<.0001
No	6693	3726	55.7	2967	44.3	
Yes	2475	1542	62.3	933	37.7	
Time stress						<.0001
No	5706	3181	55.8	2525	44.3	

Yes	3462	2087	60.3	1375	39.7	
Mental stress						0.0003
No	5645	3158	55.9	2487	44.1	
Yes	3523	2110	59.9	1413	40.1	

Table 2. The percentage of having a second child during a follow-up of 3 years after first birth(cont.)

Health status of first child						0.434
Good	8009	4613	57.6	3396	42.4	
Not good	1159	655	56.5	504	43.5	
Use of assisted reproduction technology of first child						<.0001
No	9028	5163	57.2	3865	42.8	
Yes	140	105	75.0	35	25.0	
Health care utilization of first child						0.260
No	7144	4128	57.8	3016	42.2	
Yes	2024	1140	56.3	884	43.7	
Live with parents						0.002
Yes	7695	4368	56.8	3327	43.2	
No	1473	900	61.1	573	38.9	
Complication during pregnancy						0.894
No	6208	3564	57.4	2644	42.6	
Yes	2960	1704	57.6	1256	42.4	
Postpartum depression after first child						0.019
No	7288	4140	56.8	3148	43.2	
Yes	1880	1128	60.0	752	40.0	
Type of childcare						0.940
Parents	4108	2362	57.5	1746	42.5	
Others	5060	2906	57.4	2154	42.6	
Competing demands of child care and elder care						0.598
No	8850	5091	57.5	3759	42.5	
Yes	318	177	55.7	141	44.3	
Availability of a timely helper						0.001
Yes	5489	3082	56.2	2407	43.9	
No	3679	2186	59.4	1493	40.6	
Availability of social support						0.035
Yes	8680	4967	57.2	3713	42.8	
No	488	301	61.7	187	38.3	
Availability of emotional support						0.021
Yes	8876	5081	57.2	3795	42.8	
No	292	187	64.0	105	36.0	

Table 3. Logistic regression modeling and odd ratio of having a second child during a follow-up of 3 years after first birth

Variable	OR	95% CI	P-value
Gender of first child			
Girl vs Boy	1.11	(1.02, 1.22)	0.012
Residence			
City vs Rural	0.67	(0.60, 0.75)	<.0001
Urban vs Rural	0.74	(0.66, 0.83)	<.0001
Ethnicity			
Taiwan originality vs Foreign-born	1.30	(1.10, 1.53)	0.002
Education			
College vs Junior	1.40	(1.17, 1.69)	0.000
Senior vs Junior	1.11	(0.94, 1.31)	0.229
Age at first birth			
26-30 vs ≦25	0.78	(0.70, 0.87)	<.0001
≧31 vs ≦25	0.57	(0.50, 0.64)	<.0001
Working status			
Yes vs No	1.03	(0.90, 1.19)	0.649
Family month income (NTD)			
50,000-69,999 vs ≦49,999	1.03	(0.92, 1.16)	0.605
≧70,000 vs ≦49,999	1.19	(1.05, 1.35)	0.008
Financial stress			
No vs Yes	1.22	(1.10, 1.34)	0.0001
Time stress			
No vs Yes	1.14	(1.02, 1.27)	0.019
Mental stress			
No vs Yes	1.05	(0.94, 1.17)	0.389

Note: the model was adjusted covariates of other experiences with first child