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# Parental Gender Equality and Use of Oral Contraceptives Among Young Women: A Longitudinal, Population-based Study in Sweden

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## Abstract

**Background:** Little is known about how parental gender equality early in their children lives can influence daughters' decision to use contraceptive pills. **Aim:** The study aimed at exploring whether maternal working time and paternity leave in Sweden during the first two years of their daughters' lives is associated with the use of oral contraceptives when they are adolescents or young adults. **Materials and Methods:** The study population was selected from a cohort of all Swedish fathers and mothers who had their first child together between 1988 and 1989 ( $n = 57,520$  family units). Multivariate logistic regression was used to estimate the association. **Results:** Mothers' longer working time was mildly associated with daughters' oral contraceptive pill use, though no clear trend was observed. Longer paternity leave periods ( $>30$  days) were not associated with use of oral contraceptives among their daughters, but 1-30 day periods showed a mild positive association. **Conclusion:** For maternal working time, there seems to be an association, but trends by working hours are not clear. There is no clear association between paternity leave during the first two years of their daughters' life and the use of oral contraceptives when they are adolescents and young adults.

**Keywords:** Contraceptive pill, Gender equality, Maternal working hour, Paternity leave, Unwanted pregnancy

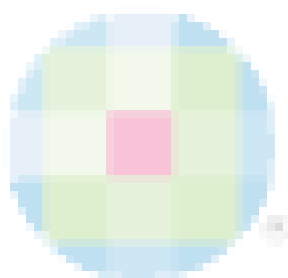
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## Introduction

Early parenthood is an event that may disrupt academic attainment and occupational success, and certain birth control methods, such as oral contraceptive pill (OCP) can help to decrease these sorts of risks.<sup>[1,2]</sup> The OCP has been become an effective, safe, and cheap way to prevent unwanted pregnancies since 1950 and became available to the public in the mid-1960 s.<sup>[3-5]</sup> The efficacy of OCP (99%) is higher compared to the condom (92%) when used correctly.<sup>[4,6]</sup> Access to OCP in Sweden is gained by prescription from a local physician or mid-wife at

youth clinic. Although studies suggest that younger women are now more concerned about side effects when considering use of OCPs,<sup>[7-9]</sup> still a large number of women in Sweden start using OCPs during their teenage.<sup>[6]</sup> The finding also identifies that women with higher education and higher income are more likely to access OCP than that of other women.<sup>[10]</sup>

Young women gradually become more independent from families of origin as they grow up, but parents' previous and current involvement may still have an influential effect on their daughters' decision making. Many early studies suggest that the relationship of parents and children and parenting style are related to adolescents or young adult's sexual behavior and contraceptive use.<sup>[11,12]</sup> Parenting style in early childhood is related with young adults' sexual health behavior, for example, neglectful parenting may affect on young women's sexual risk behavior in young adulthood.<sup>[13]</sup> The findings suggest that parental leave may be a cost-effective method for children's well-being.<sup>[14]</sup>



In 1974, Sweden became the first country in the world to allow fathers to take paid parental leave to decrease the gap of gender equality and expand men's contribution in the household.<sup>[15,16]</sup> Although gender equality is highly appreciated in Sweden, men take only 20% of parental leave days.<sup>[17]</sup> Gender equality has an impact on fertility and childbearing issues that often nowadays assumed in family-demographic research.<sup>[18,19]</sup> In this regard, fathers' uptake of parental leave increases paternal involvement to promote gender equality at the couple level, but also to strengthen the emotional bonds between fathers and children.<sup>[20]</sup>

Parental involvement into the sexual behavior of their children not only increases use of contraception among adolescent women, it is also linked to the probability of using specific birth control methods.<sup>[12,21]</sup> In addition, of many factors that may influence adolescent and young adult women's decision to use OCPs, the role of parental gender equality may play, has not been investigated yet in the best of our knowledge. This study addresses these gaps by examining parental gender equality during first two years of their daughters' lives as a possible predictor, which may affect daughters' decision to use OCPs.

The overall aim of the study was to explore the association between parental gender equality, indicated by maternal working hours (MWHs) and paternity leave (PL; during first two years of childbirth), and OCP use among their daughters at adolescence or young adulthood.

## Materials and Methods

### Study population

The study was designed as a longitudinal population-based study by linking Swedish registry data. The study population was drawn from a cohort that encompasses all Swedish fathers and mothers ( $n = 118,278$  family units) who had their first child together in 1988 and 1989. The data were collected from the Multigenerational Register (Statistics Sweden) in collaboration with researchers based at the Department of Public Health Sciences at Karolinska Institutet. The registered data were used for all individuals in the study as follows: the Swedish Population and Housing Census of 1990 (Statistics Sweden) including information on working hours; the information on PL days was collected from Social Insurance Register (National Social Insurance Board); and the Drug Register (National Board of Health and Welfare) provided information on those who filled OCPs prescriptions. The Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA) and the Migration Register (Statistics Sweden), comprised information on age and country of birth. Education collected from the Swedish National Population and Housing. Cohabitation status

(2005-07) of parents was collected from the Swedish National Population and Housing registry, and inpatient care (2005-07) of daughters was collected from the Hospital Patient Register (Swedish National Board of Health and Welfare).

All boys have been excluded from the data set because OCP is not available or effective on male reproduction. The final analysis included a total of 57,520 family units in which daughters with paternity leave were a total of 57,520 as well as daughters with MWHs were 42,160. A total of 15,360 participants' information about MWHs was missing. It is mainly due to internal missing. However, the analyses have been performed by excluding the missing information [see Figure 1].

### Outcome assessment

OCP use among daughters was considered as outcome variable in this study. The outcome variable was collected from the Drug Register during the period of 1<sup>st</sup> July 2005 to 30<sup>th</sup> June 2008. This period was chosen so that the average age of daughters in this study group were 19 years old and age span between 17-21 years. The number of OCP prescriptions among daughters ranged between 1 and 22 times, but data were categorized dichotomously. All daughters who used OCP at least once were categorized into "any use" and the rest were classified as "no use".

### Exposure assessment

#### Maternal working time

The data on MWHs were collected from the Swedish Population Housing Censuses who worked in 1990. Maternal working hour was used as an exposure because parental leave is usually used during the first two years of a child's life and the mother can prefer part-time or full-time work during this time. The age range of the

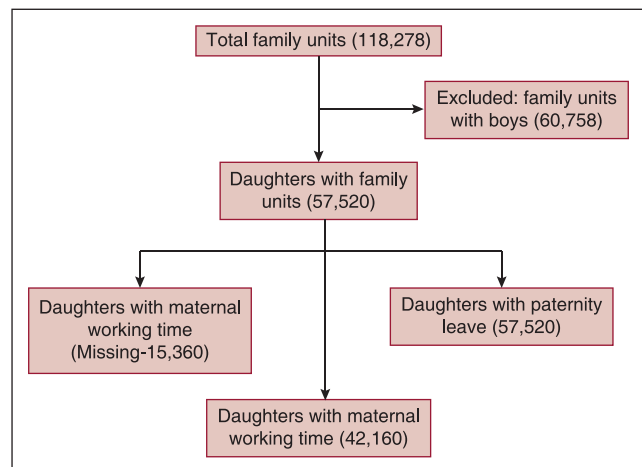


Figure 1: Flow chart for selection of study subjects

daughters in the full cohort was between 1-3 years in 1990. Maternal working hour has been counted two years after the child birth, and was made into four categories: 0, 1-19, 20-34, >34 hours per week.

### Paternity leave

Swedish PL was introduced in 1974, which enabled fathers to take paid PL until their children become 8 years old. In 1980, additional ten days so called “daddy days” in connection with childbirth was introduced exclusively to be used by the father. Sweden offered parents 360 days per child for the period from January 1988 to June 1989 and 450 days from July 1989, of which 270 days were paid at 80% of their income (around 210,000 SEK yearly). The remaining days were remunerated at a basic rate of 60 Swedish crowns (SEK) per day.<sup>[15,16]</sup> Paternity leave was included as a number of remunerated days (i.e., categories into 0, 1-30, 31-90, >90 days) during the periods of 1988-1990, come from the Swedish Social Insurance Register (Social Insurance Registry).

### Confounders

There are number of factors that may confound the association between parental gender equality and the considered OCP uses among daughters were: mother's age was categorized into four groups ( $\geq 23$ , 24-28, 29-33, >33 years); education categorized as  $\leq 9$  year's education, >9 years to college education,  $\geq 2$  year's college/university to PhD education level; country of birth dichotomized into Swedish and non-Swedish; cohabitation status (2005-07) of parents, whether parents live together or not; and inpatient care (2005-07) of daughters treated as a dichotomized variable (0 = no; 1 = yes).

### Statistical analysis

Firstly, a descriptive analysis of baseline characteristics was made. Secondly, chi-square tests were used to identify potential differences of the proportions of daughters' OCP use by MWHs and PL.

Thirdly, a multivariate logistic regression analysis was used to explore the association between parental gender equality and OCP use among daughters. Crude analyses were performed to assess the potential association between PL and OCP use among daughters and between MWHs and daughters' OCP use. Before entering into the final logistic regression model, all possible variables either being significant or acting as confounders in the multivariate analyses were kept in the model. Confounders were chosen considering the extent of changes of estimates in the multivariate model and on the partial likelihood ratio test. Decisions on potential collinearity between variables were based on Pearson correlation coefficients. The final analyses were performed

by adjusting potential confounders. The first analysis was performed between PL with all potential confounders and OCP use among daughters; second analysis was assessed MWHs with all confounders and daughters' OCP use. Odd ratios (OR) with 95% confidence intervals (CI) were computed to estimate the relationship between parental gender equality and OCP use among daughters. The level of significance was set at 0.05.

All statistical analyses were performed with IBM Statistical Package for the Social Sciences (SPSS) version 20.

### Ethical considerations

The ethical considerations regarding aim, materials and methods are within the ethical approval of Karolinska Institute Research Committee with reference the number: 2008/363-31/5.

## Results

The descriptive statistics of MWH, PL, and covariates are presented in Table 1. For maternal working time, 23.9% of the women reported no working hours, but 36% and 30.8% reported 20-34 and >34 hours, respectively. For paternity leave, 46.8% showed 0 days, with decreasing proportions in the other categories (1-30 d: 24.5%; 31-90 d: 15.5%, and >90 d: 13.2%).

Table 2 presents the difference of “no use” and “any use” of OCP among daughters by MWH and PL are both statistically significant. However, the proportion of ‘no use’ and ‘any use’ of OCPs are gradually decreased according to the number of fathers' take up PL days, but the proportion for both “no use” and “any use” of OCP among daughters is almost the same trend by MWHs.

Table 3 presents the odd ratio (OR) for parental gender equality indicators and the OCP use among daughters. The crude analyses between MWH and OCP use among daughters indicate that 1-19 hours of MWHs are not associated to use OCPs among daughters (OR = 1.03; 95% CI: 0.95-1.12), whereas daughters in 20-34 hours of MWH shows an association with the use of OCPs among daughters (OR = 1.16; 95% CI: 1.10-1.23). After controlling for confounders, there is still no significant association between 1-19 hours of mother's working hours and daughters' OCPs use. However, more than 20 hours work among mothers is positively associated with OCP use among daughters, compared to the mothers who work 0 hours.

The crude analyses between PL and daughters' OCPs use demonstrate that daughters in family units where fathers took 1-30 days of PL are more likely to use OCP



**Table 1: Distribution of characteristics for the fathers, mothers, and daughters including parental gender equality indicators (maternal working time and paternity leave) and potential confounders (age, country of birth, education, cohabitant, and inpatient care)**

Characteristics	Frequency, n (%)
Maternal working time in hours (1990)	
0	10,065 (23.9)
1-19	3,907 (9.3)
20-34	15,190 (36.0)
>34	12,998 (30.8)
Paternity leave in days (1988-1990)	
0	26,913 (46.8)
1-30	14,116 (24.5)
31-90	8,926 (15.5)
>90	7,565 (13.2)
Mothers' age in years	
≤23	18,777 (32.6)
24-28	21,672 (37.7)
29-33	11,615 (20.2)
>33	5,456 (9.5)
Fathers' country of birth	
Swedish	46,911 (81.6)
Non-Swedish	10,586 (18.4)
Mothers' country of birth	
Swedish	47,418 (82.4)
Non-Swedish	10,096 (17.6)
Daughters' country of birth	
Swedish	53,595 (93.2)
Non-Swedish	3,925 (6.8)
Fathers' formal education in years	
≤9 years	12,010 (22.6)
>9 years to college	32,439 (61.2)
>College or university	8,596 (16.2)
Mothers' formal education in years	
≤9 years	10,317 (19.3)
>9 years to college	31,788 (59.6)
>College or university	11,241 (21.1)
Mothers' cohabiting status (2005-2007)	
No	3,853 (6.6)
Yes	53,667 (93.4)
Inpatient care of daughters (2005-2007)	
No	54,488 (94.7)
Yes	3,032 (5.3)

(OR 1.61; 95% CI: 1.54-1.69) than fathers with 0 days of leave. Daughters whose fathers took more than 90 days paternity leave are also more likely to use pills (OR 1.14; 95% CI: 1.08-1.21), compared to fathers who took 0 days of leave. When age, country of birth, education, inpatient care and cohabitant status are controlled for, the results show that daughters whose fathers took 1-30 days of leave are still significantly associated to use of OCP (OR = 1.11; 95% CI: 1.06-1.17), whereas no statistically significant association remained in the other categories.

**Table 2: Percentage of oral contraceptive pill (OCP) use among daughters by parental gender equality indicators**

Indicators of parental gender equality	Daughters' contraceptive pill, n (%)		Pearson $\chi^2$ for trend (P-value)
	No use	Any use	
Maternal working time (hours per week)	11,790 (100)	30,370 (100)	0.001
0 hours	2,956 (24.5)	7,109 (23.1)	
1-19	1,124 (10.1)	2,783 (9.3)	
20-34	3,997 (34.3)	11,193 (36.5)	
>34	3,713 (31.1)	9,285 (31.1)	
Paternity leave (days)	18,752 (100)	38,768 (100)	0.001
0	9,873 (53.2)	17,040 (44.2)	
1-30	3,734 (19.5)	10,382 (27.1)	
31-90	2,598 (14.3)	6,328 (15.6)	
>90	2,547 (13.0)	5,018 (13.1)	

**Table 3: Logistic regression with odds ratios (OR) for the association between parental gender equality indicated by maternal working time and paternity leave, and the oral contraceptive pill (OCP) use among daughters**

Indicators of parental gender equality	OR (95% confidence interval)	
	Crude	Adjusted <sup>1</sup>
Maternity working time (hours per week)		
0	1	1
1-19	1.03 (0.95-1.12)	1.03 (0.95-1.12)
20-34	1.16 (1.10-1.23)	1.18 (1.11-1.25)
>34	1.04 (0.98-1.10)	1.10 (1.04-1.17)
Paternity leave (days)		
0	1	1
1-30	1.61 (1.54-1.69)	1.11 (1.06-1.17)
31-90	1.41 (1.34-1.49)	1.04 (0.99-1.10)
>90	1.14 (1.08-1.21)	0.96 (0.90-1.01)

<sup>1</sup>Adjusted for age, country of birth, education, inpatient care, and cohabitation

## Discussion

The purpose of this study was to examine how parental gender equality, as measured by MWH and PL, first 2 years of their daughters' early lives is related to daughters' use of OCPs at adolescence and young adulthood. A positive association was observed between MWH and OCP use among daughters, though the trend by working periods was not clear. However, the result between PL and daughter's OCP use did not reveal any clear association as a whole.

The results shed light on MWHs and daughter's OCP use by indicating that having a mother who worked more than 20 hours was positively associated with the use of OCP, compared to having a mother who worked

less than 20 hours. The reason may be that mothers, who worked more, were likely to be more educated and used contraception including OCP to prevent unwanted pregnancy for their successful career. The results also support early research showing that women with higher education and high income are more aware of sexual and reproductive health, and have better access to birth control pills.<sup>[10]</sup> Further, mothers' education adjusted as a confounder in the final analysis, had an influential impact on the use of daughters' OCPs. Thus, it indicates that educated-mothers may have a larger effect on their daughters' use of OCPs because it is closely tied to their daughters' academic success, and to the likelihood that mothers' educational values promotes their daughters' knowledge and skills of future career awareness.<sup>[22,23]</sup> Studies have also found that mothers with good educational background are likely to have low fertility rate, which increases their autonomy and ability to make decisions.<sup>[24]</sup>

Findings suggesting that fathers' 1-30 days of leave indicate a statistically significant result with increased OR, but fathers may not be recommended taking only 1-30 days of PL so that their daughters would use OCPs. Fathers with 1-30 days of leave may correspond to more than the one or two weeks of so called "daddy days" may have more concern about their daughters' development and sexual behavior that links to use of contraceptives including OCPs. As evidence indicates that couples where fathers took more than one or two weeks are more likely to have higher fertility.<sup>[25]</sup> On the other hand, fathers who took more than 30 days of leave had no association with daughters' use of OCPs. But as it has already been established, that early paternal involvement influences the children choice of contraceptives, and may also have a positive impact in the development of a child's health, psychosocial, and adolescent behavior<sup>[14,26-28]</sup>, which may in turn be influenced in their decision making in later life, including choosing OCP. The reason for this result may be that fathers, who took more than 30 days of leave, did not play such influential role on their daughters' early lives behavior so that daughters may take initiatives of using OCPs in later life (adolescence and adulthood). Other underlying factors may affect on daughters' use of OCPs, for example the awareness of side effects of OCPs.<sup>[9,29]</sup> In addition, the behavior and examples set by conservative or liberal fathers in the two extremes could shape, to a certain extent, the future willingness of their daughters to use. However, the results of PL and daughters' OCP use in this study are somehow contradictory. Further studies are recommended in order to clarify whether paternity leave, used as an indicator of parental gender equality, may influence daughters' use of OCP in adolescent and young adult life.

## Strengths

The main strength of this study is that it is based on a large sample size that encompasses all parents whose first child was born between 1988 and 1989, which means that it had sufficient power to observe the association between parental gender equality and daughters' OCP use. As a large population register-based study, the accuracy of data was reliable, and a wide variety of socio-economic and socio-demographic factors could be analyzed including age, education, and country of birth. The exposures and confounders were drawn from the same data set. Although the data was collected from different sources, it was constructed using a unique serial number for each participant.

The accuracy of outcome variable was reliable as the information of the OCP use was extracted from the Swedish Drug Register. Around 57,520 family units contributed to the final analysis leading narrow confidence intervals. As a result, it was easy to detect effects.

## Limitations

The potential limitation is that without evaluating the impact of other aspects of gender equality that may affect on daughters' decision making to use OCPs; it is not sufficient to only look at the distribution of PL. It needs to be grasped other factors of gender equality concepts, such as income, occupation, domestic duties, temporary childcare, and household working. Besides, the level of fathers' parental leave use in Sweden might not be considered as a true reflection of gender equality. Prior research implies that only 13% of couples shared parental leave equally<sup>[17]</sup>, whereas parents' equality was defined when each parent took 40-60% of the total parental leave.<sup>[30]</sup> Our study also found that almost 47% of fathers took 0 days of paternity leave, whereas only 13% of fathers received more than 90 days of leave. Although Swedish fathers' take up parental leave is highly appreciated and increasing steadily, men's take up parental leave still not so high as well as they are not actively entered household activities to the higher extent.<sup>[20,31]</sup>

As a matter of fact, association between parental gender equality and daughters' condom use might potentially be more relevant, as a woman exposed to values of gender equality may be more able to require from her male partner to use condoms rather than taking all the responsibility herself using OCP. Additionally, daughters who have been categorized into "no use" of OCP, they may have a preference for other contraceptive methods. In fact, daughters who had prescription of OCPs from doctors or mid-wife, but they might even not pick the pills out from pharmacy. And even if they did so, they might not use them. These misclassifications of using OCPs may lead to either an over-estimate or under-estimate of the study results.

## Conclusion

To conclude, this study suggests that maternal working time is indeed positively related to daughters' OCPs use, but we are careful in not claiming that our findings necessarily reflect the causal impact of gender-equal behavior on daughter's OCP use. On the other hand, PL as a whole may not significantly affect daughters' OCPs use, but fathers' some days of PL may play an important role on OCPs use among their daughters. In addition, gender equality in couple is a matter of equity involving all spheres of life wherein parental leave between parents might not be reflected as a true marker of parental gender equality. We, therefore, argue here that other measurements of gender equality may be combined to measure on how parental gender equality impact on daughters' use of OCPs.

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