Gendered Responsibilities, Elderly Care, and Labor Supply: Evidence from Four Countries*

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Abstract

This paper explores the relationship between providing care to older parents/parents-in-law and labor supply for both men and women aged 40 to 59 in Poland, Colombia, and Indonesia. In addition, we investigate the relationship between an individual's parents' disability status and labor supply in Egypt. Overall, we find that providing care to older parents is associated with significant reduction in probability of employment, weekly hours worked, and annual earnings. Additionally, this decline is significantly larger among female individuals than male and among intensive caregivers who provide care more than 10 hours per week. We also find large heterogeneity in each country, where significant decline in employment is the largest in Poland and Colombia for both women and men. We observe that men in Indonesia experience large decline in work hours and annual earnings, which is driven by their transition to casual employment. In Egypt, we find that labor supply for men and women is not affected by the presence of disabled parent/parent-in-law.

Keywords: female labor force participation, long-term care, time use.

JEL codes: J14, J16, J22.

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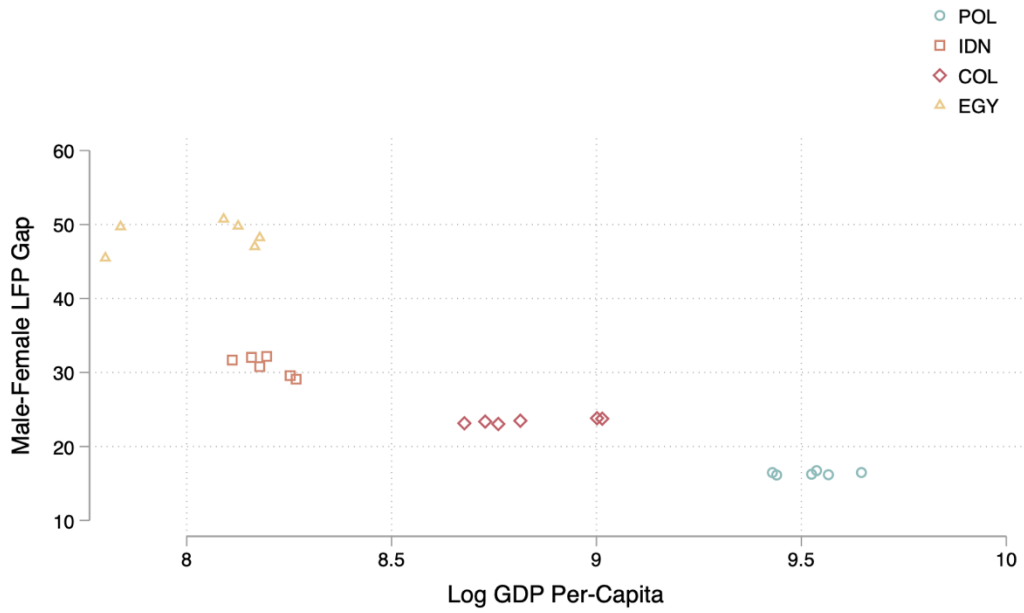
1. Introduction

The world population is aging; WHO predicts that 1 in 6 of the world population will be aged 60 years or over in 2030 (WHO, 2021). The developing world is aging faster; 57 percent of the world's population aged 75 and above—more than 138 million people—lived in developing regions in 2015. It is expected that by 2050, nearly 8 out of 10 of the world's older persons will be living in the developing regions (UN Women, 2017). This trend suggests that there will be an increase in the demand for long-term care (LTC) for older persons. In fact, ILO estimates that the global need for care of older persons will increase by 50 percent—from 0.2 billion in 2015 to 0.3 billion in 2030—faster than the need for care of young children (ILO, 2018). Care for older parents has traditionally—and still to a large extent—been provided by adult children through an "implicit social contract" whereby adult children return the care they received in their childhood (Folbre, 2014). The marketization of care work can be perceived as devaluing the "sacredness" of care and diminishing the quality and authenticity of the care provided (England and Folbre, 1999; Himmelweit, 1999). However, this traditional arrangement may not be sustainable with the increasingly aging population: reduction in fertility rates implies that older parents will depend on fewer adult children. Meanwhile, the market for formal LTC services is underdeveloped with limited supply and/or non-affordable cost (Spillman et al., 2014; Agree & Glaser, 2009).

Due to gender stereotypes, much of the informal care responsibility is heavily shouldered by women (UN Women, 2017). Time-use surveys from 64 countries suggest that women bear 76.2 percent of the total time spent on unpaid care work, 3.2 times more than men (ILO, 2018). Often in their prime working years, care providers can experience various negative effects on their labor supply caused by the care burden (Connelly et al., 2018; Fahle & McGarry, 2017). The global estimate suggests that 647 million working-age individuals are outside of the labor force due to family responsibilities; 606 million of whom are women (ILO, 2018). Because of this, it is imperative to discuss whether this unequal burden imposes a disproportionate toll on the labor supply between genders.

This paper explores the relationship between providing care to older parents/parents-in-law and labor supply for both men and women in Poland, Colombia, Indonesia, and Egypt, four middle-income countries in four different regions. Due to data limitations in Egypt, we look at the relationship between an individual's parents' disability status and labor supply instead. To conduct this analysis, we utilize a combination of rich time-use surveys and longitudinal household survey data to explore this relationship among individuals aged 40 to 59. Overall, we find that there is a significant negative correlation between labor supply and parental care for older, working-age, adults in all four countries. This negative impact spans both the extensive and intensive margins of employment, for both men and women. Though the negative effect on labor supply is stronger among women than men, consistent with other findings in the literature. Consistent with the literature, our results also show a stronger labor supply effect among those who provide intensive caregiving of more than 10 hours per week compared to those who provide care of less than 10 hours a week.

Figure 1. GDP per-capita and Labor Force Participation Gap (2013-2018, Male-Female 15+)



Notes: This graph visualizes the relationship between GDP per-capita and male-female labor force participation gap between 2013 to 2018 among individuals aged 15+. Data are extracted from World Bank Gender Data Portal.

It is useful to contextualize our findings against the backdrop of different labor market landscapes in the four countries. As depicted in Figure 1, there is a negative correlation between a country's gender gap in labor force participation and per capita GDP. When looking at each specific country, we find that in Poland and Colombia, both men and women who provide parental care is significantly less likely to be employed. Specifically, we see a 17 percentage points decline in employment from the mean among women (16 p.p. in men) in Poland and a 20 percentage points decline among women in (16 p.p. in men) Colombia associated with having to provide care to parents. In Poland, this reduction in employment is driven by a reduction in formal, wage employment, whereas in Colombia the decline is driven by both wage employment and casual employment. In Indonesia, while there is no overall change in the extensive margin of labor supply for both genders, we see a significant decline in formal employment among both men and women. However, while men transition from formal to informal employment when they provide care for their parents, we do not see this transition among female workers. When looking at the intensive margin, we observed a reduction in weekly work hours and annual earnings among men and women in Poland, whereas a similar decline is only observed among men in Indonesia. In Colombia, the reduction in work hours is only observed among female workers. On the other hand, our evidence from Egypt shows that there is no significant correlation between an individual's parents' disability status and the overall labor supply for both men and women.

In addition to the extensive margin of providing parental care, we also investigate how the intensity of parental care (as measured by the number of hours providing care per week) relates to labor supply. Similar to the extensive margin, we find that there is a negative relationship between care hours per week

and labor supply conditional on providing care. We observe a slightly larger estimate among men than women, which may be driven by the higher propensity for men than women to be employed in the formal sector where the schedule is rigid and less flexible.

To look at how parental care interacts with individual characteristics, we also investigate how our results will change among individuals with different educational levels. Among men, we find that there is no differential impact on employment based on education level. On the other hand, we observe a larger negative impact among women who are highly educated, which may be driven by the significantly higher base employment rate among women who are highly educated. Because of this, parental care responsibility would likely have more effect on this particular group of female individuals.

Responsibilities for childcare and parental care are often intertwined. When investigating the broader family structure, the presence of children can either help alleviate the burden for parental care or exacerbates the care responsibilities for adults in the household. We find evidence for the former among men, where the presence of older children aged 13-18 and above seems to act as an additional helper for men in the household to provide care to older parents. Among women, we find similar evidence with the presence of young children aged 0-6 in the household.

This paper builds on the growing literature on the relationship between parental care for older parents and labor supply and how it interacts with gender. While there is a vast literature that shows a negative relationship between parental care and labor force participation, most of the analysis has been done in developed countries in Europe and the United States. Ettner (1995) is one of the first papers which find that coresidence with disabled parents leads to a significant reduction in work hours among female individuals aged 35-64 in the United States. Since then, more recent literature also finds reduced labor supply due to parental care among individuals aged 50+ (Johnson & Lo Sasso, 2006; Johnson & Lo Sasso, 2000; Van Houtven et al., 2013; Fahle & McGarry, 2017; Heger & Korfhage(2020)). In Europe, similar findings are found among elderly individuals (Bolin et al., 2008; Carmichael & Charles, 2003; Ciccarelli & Van Soest, 2018; Kotsadam (2011)). In Australia, Nguyen & Connely (2014) and Bittman et al. (2007) find a similar negative relationship between caregiving and labor supply. More importantly, some findings indicate a larger impact on women's labor supply compared to men. While Carmichael & Charles (2003) find that men and women carers are less likely to be in paid work, conditional on working, women earn significantly less than men. Fevang et al. (2012) find an almost 4 times larger impact on a daughter's labor supply compared to a son's during the years before the parent's death. Van Houtven et al. (2013) similarly find reduced hours worked among women conditional on working, while they find no such effect on men. Our analysis contributes to this literature by exploring the relationship between parental care and labor supply in middle-income countries in regions that are aging faster than any other in the world (Southeast Asia, North Africa, Latin America, and Eastern Europe).

While the majority of the aging population lives in low- and middle-income countries, LTC is yet to be recognized as a burning policy issue (UN Women, 2017). Moreover, the evidence from lower- and middle-income countries is more limited and much of it has been focused on China. In Turkey, Terkoglu

& Memis (2022) find that providing care to older adults has a statistically significant impact on the labor force participation of women aged 30-49. In Nepal, Sinha & Sedai (2022) find that both men and women experience a decline in labor supply, with a larger impact found on women. Liu et al. (2010) find that while caring for one's parents does not affect a woman's labor market outcomes, caring for a parent-in-law harms a woman's labor supply in paid work and work hours in China. Chai et al. (2021) find an inverse relationship between caregiving and labor force participation among men, while the results are mixed for women. Huang et al. (2021) show that providing care to parents/parents-in-law at home exerts a negative effect on female caregivers' well-being. Chen et al. (2017) also show that married women who spent more than 15 hours per week in eldercare are less likely to participate in the labor force. They also find that intensive caregivers (defined as more than 15 hours per week) work significantly fewer hours of paid work each week when they remain employed. Other papers that also find no negative impact of eldercare on labor supply in China include Mao et al. (2018) and Wang & Zhang (2018). This paper is most closely related to Stampini et al. (2020), who focus their analysis on Mexico, Chile, Colombia, and Costa Rica. Across these countries, they find that women who provide LTC are less likely to work. Additionally, conditional on working, women who provide parental care also work fewer hours per week than those who do not.

The rest of the paper is structured as follows. Section 2 describes the data and the two treatment variables used in this paper, followed by the methodology in Section 3. Section 4 discusses the main results from our main analysis using long-term parental care as our variable of interest. Section 5 follows up with heterogeneity analysis and sensitivity analysis in Section 6 with various control groups, which will be followed by conclusion in Section 7.

2. Data

Our analysis focuses on four countries: Colombia, Egypt, Indonesia, and Poland. For Poland and Colombia, we take advantage of rich time use data from the 2017 National Survey of Time Use (Colombia) and the 2013 Poland Time Budget Survey. Due to the lack of time-use surveys in Indonesia, we utilize a rich panel household survey from the 2014 wave of the Indonesia Family Life Survey (IFLS). For Egypt, we utilize the 2018 Egypt Labor Market Panel Survey (ELMPS) to construct our proxy treatment variable, which is defined below. Since Egypt data does not have information on parental care, we use the individual's parents' disability status as a proxy to provide long-term care.

Due to the difference in the source of data used, there is a slight difference in how our long-term care variable is defined. The time-use surveys from Poland and Colombia directly ask our survey respondents (adult children) whether they provide care for their parents. In Indonesia, IFLS instead asks each older parent whether their children often provide help in conducting their daily activities. In all three countries, in addition to the extensive margin, we also extract information on the number of hours spent per week on providing parental LTC. Since Egypt does not have information on providing long-term care, we utilize the information on whether an individual parent reports having some degree of difficulty in

conducting some form of daily activities. We use this information as a proxy for our main treatment variable for Egypt. The detailed construction of these variables from every four countries is detailed below in Table 1.

Our main outcome variables are individuals' labor supply. For the extensive margin, we look into the association between our main treatment variables and whether an individual is currently working. We also disaggregate our results based on the informal/formal sector. The formal sector includes wage workers such as private/government employees. The informal sector is defined as someone who is self-employed or someone who works as a casual family worker. We also look into the impact of parental care on the intensive margin including conditional hours worked and annual earnings among those who keep working. For annual earnings, we transform earnings from each individual from each country to be equivalent to 2018 US Dollars.

Table 1. Definition of Long-Term Care by Country

Country (Year)	Definition of Treatment Variables
Poland (2013)[1]	Provide care to older parents who are ill/disabled
Indonesia (2014)[2]	Older parents report receiving help for activities of daily living (ADL) or instrumental activities of daily living (IADL)
Colombia (2016)[3]	Provide help to older parents with activities such as: 1) Feed/bath 2) Medical appointment 3) Providing medication
Egypt (2018)[4]	Individual's parent report having some difficulty or unable to 1) Walk/climb stairs 2) Self-care such as washing all over or dressing

[1] Poland Population Time Budget Survey 2013
[2] Indonesia Family Life Survey 2014-2015
[3] Colombia *Encuesta Nacional De Uso Del Tiempo (ENUT) 2016-2017*
[4] Egypt Labor Market Panel Survey 2018

3. Methodology

To estimate the relationship between provision of parental long-term care/presence of disabled parent and labor supply in Colombia, Indonesia, Poland, and Egypt, we estimate the following equations for each individual *i*:

$$L_i = \beta_0 + \beta_1 LTC_i + \beta_2 X_i + \mu_i \quad (1)$$

To fully understand how gender interacts with the provision of long-term care and labor supply, we separate our estimation results for males and females. In addition to running the harmonized estimates, we also run our estimates separately for each country. *L* represents our dependent variables: a dummy

variable that indicates whether an individual is currently working, types of employment, conditional hours worked per week, and annual earnings conditional on working. *LTC* is our main treatment variable and indicates whether an individual is providing care to their parents/parents-in-law who are 60 years and above. In the case of Egypt, LTC refers to an individual's parent disability status. *X* is a vector of individual and household characteristics such as individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, marital status, and country fixed effects in our harmonized analysis.

Additionally, in order to observe whether the differential impact of LTC on men and women's labor supply is significant, we also run our analysis interacting LTC dummy and gender dummy. Specifically, we will run:

$$L_i = \beta_0 + \beta_1 LTC_i + \beta_2 Male_i + \beta_3 LTC_i \cdot Male_i + \beta_4 X_i + \mu_i \quad (2)$$

In our main analysis, we focus on midlife individuals aged 40-59 because these individuals are the subpopulation most likely to provide care (Moussa et al. (2019)). Moreover, our data also shows that the majority of elderly parent carer are those who are aged 40-59, as shown in Appendix Figure 1. Meanwhile, individuals aged 60 and above are excluded because there is a large probability that the parents of these individuals are deceased and they themselves may be in need of care. Since the decision to provide parental LTC is endogenous, we do not claim causality in our analysis. For example, there is a potential of reverse causality, where the lack of labor market opportunities may imply lower opportunity costs of becoming caregivers.

4. Results

4.1 Coresidency and care needs

Table 2 shows the basic summary statistics for co-residency and care needs for men and women. They also show whether there is a significant difference in these statistics between men and women. Table 2 shows that in all four countries, the share of co-residency with parents is generally higher among men than women. However, we also see a higher proportion of women who is a spouses to older adults. We also observe a higher proportion of men who live with a disabled parent in Poland, while the proportion is equal between genders in Indonesia, Egypt, and Colombia. Despite this, women bear the majority of the responsibility to provide care for their parents. In general, women are at least twice more likely to provide care to their older parents compared to men. We also observe that among the 3 countries, Indonesia has the largest proportion of women who provide LTC to their parents while Poland has the smallest proportion of women who provide LTC. In addition, in Indonesia, women spend significantly longer time caring for their parents conditional on providing care, while in Colombia men spend slightly longer time than women.

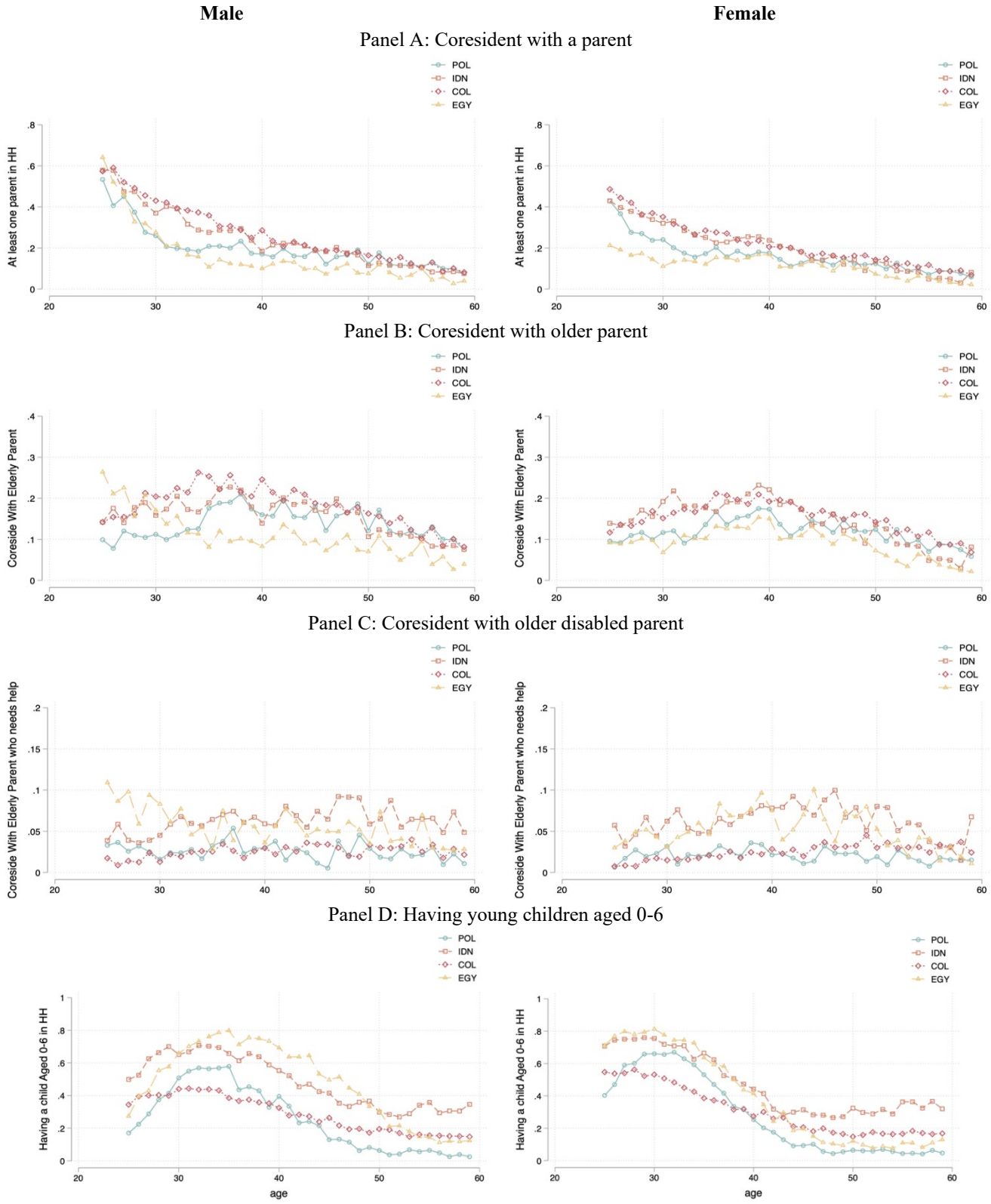
Figure 2 shows how the basic co-residency and care need in Table 2 change as individuals age in all four countries. In these figures, we include individuals from ages 25 to 59 to see a more complete picture of this evolution. Among all four countries, Egypt has the highest fertility for both men and women. Moreover, we also observe that men experience the peak of childbearing at a much older age than women. We also see a downward trend in co-residency with age, which is not surprising given the increasing number of deceased older parents as individuals age.

Table 2. Coresidency and long-term care provision among individuals (age 40-59)

	Poland (2013)		**Indonesia (2014)**		**Colombia (2016)**		**Egypt (2018)**	
	Male	Female	Male	Female	Male	Female	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coreside with an older parent	0.134	0.108***	0.142	0.124**	0.164	0.141***	0.083	0.081
	(0.341)	(0.311)	(0.349)	(0.330)	(0.370)	(0.348)	(0.277)	(0.274)
Relationship to the older adult:								
Spouse	0.047	0.145***	0.005	0.186***	0.030	0.212***	0.007	0.269***
	(0.211)	(0.352)	(0.067)	(0.389)	(0.171)	(0.409)	(0.086)	(0.443)
Child	0.101	0.080***	0.076	0.097***	0.129	0.131	0.079	0.044***
	(0.301)	(0.271)	(0.265)	(0.295)	(0.335)	(0.337)	(0.270)	(0.205)
Child-in-law	0.034	0.028	0.066	0.028***	0.035	0.011***	0.004	0.037***
	(0.181)	(0.166)	(0.249)	(0.165)	(0.184)	(0.105)	(0.066)	(0.190)
# of coresident parents in the household	1.200	1.158*	1.224	1.145***	1.233	1.224	1.124	1.174*
	(0.400)	(0.364)	(0.417)	(0.353)	(0.423)	(0.420)	(0.356)	(0.380)
# of elderly parents in the household	1.201	1.158*	1.174	1.141	1.222	1.219	1.101	1.141
	(0.401)	(0.365)	(0.379)	(0.349)	(0.415)	(0.413)	(0.302)	(0.349)
Older parent(s) have a chronic illness			0.068	0.069	0.120	0.108***	0.052	0.038**
			(0.252)	(0.253)	(0.325)	(0.311)	(0.221)	(0.191)
Share of disabled older parent	0.023	0.018*	0.076	0.079	0.029	0.031	0.048	0.050
	(0.149)	(0.132)	(0.265)	(0.270)	(0.167)	(0.173)	(0.214)	(0.218)
Provide parental care to older parent	0.008	0.014**	0.020	0.076***	0.004	0.015***		
	(0.090)	(0.119)	(0.142)	(0.265)	(0.065)	(0.123)		
Time spent providing care to older parents (hours/week)	9.079	9.567	14.666	19.221	11.268	8.194*		
	(8.273)	(8.159)	(20.880)	(26.760)	(17.151)	(9.197)		
# of children aged … in the household								
0-6	1.230	1.197	1.208	1.226	1.226	1.259*	1.429	1.409
	(0.470)	(0.451)	(0.460)	(0.508)	(0.520)	(0.573)	(0.692)	(0.750)
7-12	1.215	1.172*	1.224	1.214	1.247	1.213**	1.497	1.352***
	(0.473)	(0.419)	(0.492)	(0.476)	(0.534)	(0.500)	(0.656)	(0.599)
13-18	1.265	1.250	1.221	1.214	1.281	1.250**	1.501	1.432***
	(0.530)	(0.515)	(0.469)	(0.453)	(0.538)	(0.517)	(0.628)	(0.627)
Observations	4,769	8,656	4,906	5,077	15,925	19,453	4,841	4,860

Notes: The columns show means and standard deviations for each variable in different countries, separately for men and women. Standard deviations are shown in parentheses. *, **, *** in 'Female' columns indicate that the null hypothesis for similarity of means between male and female sample within each country is rejected at 10%, 5%, and 1% level, respectively.

Figure 2. Share of individuals (age 25-59) with a coresident parent and young children in the household



4.2 Determinants of Parental Care

Before diving into the relationship between labor supply and parental care, we try to investigate factors that determine parental care. To do this, we regress our explanatory variable (parental care) on individual and household characteristics. The results are presented in Table 3. We observe that higher-educated women are less likely to provide parental care. This negative relationship among women might be driven by the increasing opportunity costs among women who are higher educated and who are more likely to be in a higher-paying job. This implies that there is a selection of parental care providers among women, where lower-educated women are more likely to provide care to an elderly parent. We also observe that being married reduces the likelihood to provide parental care. Women are more likely to provide care to their parents as they age, while this relationship is not significant among men. When looking at household composition, we observe that the number of children aged 0-18 is associated with an increase in the propensity for providing parental care for men.

Table 3. Determinants of Parental Care

	Parental care	
	Male	Female
	(1)	(2)
Primary Or Less	0.000	0.000
	(.)	(.)
Secondary	0.000	-0.009***
	(0.002)	(0.002)
Tertiary	0.001	-0.010***
	(0.002)	(0.002)
Married	-0.018***	-0.021***
	(0.002)	(0.002)
Age	0.003	0.008***
	(0.002)	(0.003)
Age-sq	-0.000	-0.000***
	(0.000)	(0.000)
# children 0-6	0.004**	-0.002
	(0.002)	(0.002)
# children 7-12	0.004***	-0.001
	(0.001)	(0.001)
# children 13-18	0.002**	-0.002*
	(0.001)	(0.001)
Constant	-0.054	-0.125*
	(0.055)	(0.069)
Observations	29727	36520
Mean	0.014	0.026

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individuals aged 40-59 from Poland, Indonesia, and Colombia.

4.3 Labor Supply

Next, we investigate the difference in labor supply between men and women. We also observe the gender difference between LTC providers and non-provider (disabled parents vs. non-disabled parents for Egypt). As well documented in the literature, we see a large disparity in labor supply between men and

women in all four countries. In general, men are more likely to be employed, work longer hours conditional on working, and earn higher annual earnings than women. In addition, men are in general more likely to be employed in wage employment and self-employment while are also less likely to be employed as casual/family workers.

Unsurprisingly, this gender disparity in labor supply is even more pronounced among non-parent (non-disabled parent) carers in all four countries. For example, the difference in hours worked between men and women is smaller and not significant among parent carers in Poland and Indonesia. We also observe a similar trend in the gender difference in wage employment, self-employment, and casual/family work. Since the decision to provide care to older parents is endogenous, there will be selection into becoming a care provider that plays a role in muting the gender disparity in labor supply.

It is also interesting to note the different labor market landscapes in the four countries. Looking at non-carers as the baseline, around 90 percent or more males aged 40-59 in Indonesia, Colombia, and Egypt are employed; the share is lowest in Poland with 76 percent. In contrast, there are more variations in the employment of females aged 40-59; the highest share is in Indonesia with 73 percent of women employed, compared with around 60 percent in Poland and Colombia and merely 24 percent in Egypt. There are also different degrees of formality in the labor market. Roughly half of the employment in Poland (for both women and men) is in wage work. Meanwhile, employment in Colombia and Indonesia is predominated by casual and self-employment. While there is a greater share of wage workers among male in Egypt (67 percent), much fewer women work as wage workers (16 percent). These are important contexts considering that there are different social norms around women's work in these four countries and that casual and self-employment may offer more flexibility to combine paid market and unpaid care work.

Table 4. Labor supply among individuals aged 40-59

	Carer			Non-carer			
	Male	Female	M – F	Male	Female	M – F	(3) – (6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Poland							
Employed	0.462	0.432	0.0295	0.759	0.636	0.123***	-0.094
	(0.505)	(0.497)		(0.428)	(0.481)		
Hours worked / week	36.111	35.000	1.111	43.125	38.594	4.531***	-3.42
	(11.146)	(12.232)		(10.038)	(9.992)		
Wage worker	0.179	0.296	-0.117	0.528	0.492	0.036***	-0.153*
	(0.389)	(0.458)		(0.499)	(0.500)		
Self-employed	0.282	0.120	0.162*	0.227	0.122	0.105***	0.057
	(0.456)	(0.326)		(0.419)	(0.327)		
Casual/family worker	0.000	0.016	-0.016	0.004	0.022	-0.018***	0.002
	(0.000)	(0.126)		(0.063)	(0.148)		
Annual earnings (USD)	3893.03	4331.42	-438.4	5431.29	4758.31	673.0***	-1111.3*
	(2513.70)	(1769.45)		(2078.07)	(1875.48)		
Primary educated or less	0.154	0.128	0.026	0.109	0.106	0.003	0.022
	(0.366)	(0.335)		(0.312)	(0.307)		
Secondary educated	0.769	0.672	0.097	0.719	0.657	0.061***	0.036
	(0.427)	(0.471)		(0.450)	(0.475)		
Tertiary educated	0.077	0.200	-0.123	0.172	0.237	-0.065***	-0.058
	(0.270)	(0.402)		(0.378)	(0.425)		
Observations	39	125		4730	8531		
Panel B: Indonesia							
Employed	0.945	0.713	0.232***	0.956	0.726	0.231***	0.002
	(0.229)	(0.453)		(0.204)	(0.446)		
Hours worked / week	33.372	33.306	0.0659	39.195	34.230	4.965***	-4.899*
	(21.009)	(22.820)		(21.265)	(23.811)		
Wage worker	0.319	0.169	0.15***	0.369	0.196	0.173***	-0.023
	(0.469)	(0.375)		(0.483)	(0.397)		
Self-employed	0.462	0.321	0.141*	0.445	0.317	0.128***	0.013
	(0.501)	(0.468)		(0.497)	(0.465)		
Casual/family worker	0.165	0.220	-0.0548	0.140	0.208	-0.068***	-0.013
	(0.373)	(0.415)		(0.347)	(0.406)		
Annual earnings (USD)	1278.01	803.90	474.1**	1394.50	799.05	595.5***	-121.35
	(1374.15)	(1264.89)		(1288.81)	(1165.54)		
Primary educated or less	0.330	0.557	-0.228***	0.427	0.570	-0.143***	-0.085
	(0.473)	(0.498)		(0.495)	(0.495)		
Secondary educated	0.462	0.334	0.127*	0.438	0.332	0.107***	0.02
	(0.501)	(0.473)		(0.496)	(0.471)		
Tertiary educated	0.209	0.108	0.101*	0.135	0.099	-0.036***	0.065
	(0.409)	(0.311)		(0.341)	(0.298)		
Observations	91	296		4,351	3,601		

Table 4. Labor supply among individuals age 40-59 (*continued*)

	Carer			Non-carer			
	Male	Female	M – F	Male	Female	M – F	(3) – (6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel C: Colombia							
Employed	0.687	0.416	0.270***	0.885	0.569	0.316***	-0.046
	(0.467)	(0.494)		(0.319)	(0.495)		
Hours worked / week	45.457	36.258	9.198***	49.696	41.748	7.948***	1.250
	(14.725)	(16.310)		(14.384)	(16.537)		
Wage worker	0.254	0.141	0.113*	0.328	0.230	0.098***	0.015
	(0.438)	(0.349)		(0.469)	(0.421)		
Self-employed	0.418	0.245	0.173**	0.520	0.285	0.235***	-0.062
	(0.497)	(0.431)		(0.500)	(0.451)		
Casual/family worker	0.015	0.030	-0.015	0.038	0.054	-0.016***	0.001
	(0.122)	(0.171)		(0.191)	(0.227)		
Annual earnings (USD)	4606.89	3488.75	1118.1	3733.00	3330.56	403.4***	714.7
	(2872.13)	(2828.99)		(2489.28)	(2564.28)		
Primary educated or less	0.284	0.333	-0.05	0.377	0.358	0.019***	-0.069
	(0.454)	(0.472)		(0.485)	(0.480)		
Secondary educated	0.403	0.404	-0.001	0.411	0.409	0.002	-0.003
	(0.494)	(0.492)		(0.492)	(0.492)		
Tertiary educated	0.313	0.263	0.051	0.211	0.232	-0.021***	0.072
	(0.467)	(0.441)		(0.408)	(0.422)		
Observations	67	298		15,856	19,139		
Panel D: Egypt							
Employed	0.854	0.306	0.548***	0.896	0.244	0.652***	-0.103***
	(0.321)	(0.470)		(0.281)	(0.434)		
Hours worked / week	45.143	36.605	8.538***	47.011	36.260	10.75***	-2.212
	(18.701)	(13.151)		(17.746)	(14.980)		
Wage worker	0.644	0.207	0.437***	0.665	0.162	0.503***	-0.066
	(0.480)	(0.406)		(0.472)	(0.369)		
Self-employed	0.202	0.041	0.16***	0.225	0.041	0.184***	-0.024
	(0.402)	(0.199)		(0.418)	(0.198)		
Casual/family worker	0.009	0.074	-0.065*	0.008	0.046	-0.038***	-0.028*
	(0.092)	(0.263)		(0.091)	(0.209)		
Annual earnings (USD)	1468.32	1292.61	175.7	1588.65	1483.99	104.7**	71.057
	(937.08)	(649.23)		(908.68)	(785.07)		
Primary educated or less	0.412	0.541	-0.129**	0.406	0.601	-0.195***	0.065
	(0.493)	(0.499)		(0.491)	(0.490)		
Secondary educated	0.403	0.281	0.122**	0.396	0.275	0.121***	0.002
	(0.492)	(0.450)		(0.489)	(0.447)		
Tertiary educated	0.185	0.178	0.007	0.198	0.124	0.074***	-0.067*
	(0.389)	(0.383)		(0.398)	(0.330)		
Observations	233	242		4,567	4,592		

Notes: Columns 1, 2, 4, and 5 show means and standard deviations for each variable for male and female samples, as indicated. Standard deviations shown in parentheses. Column 3, 6, and 7 tests statistical significance of difference in means. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively.

4.4 How does parental care differentially affect male and female labor supply?

We begin by looking at the relationship between parental care and labor supply for men and women aged 40-59 in all four countries combined. Panel A in Table 5 presents the results for males, while panel B presents the results for females. We find that providing care to older parents is associated with a significant reduction in labor supply for both men and women. This reduction applies not only to the probability of employment but also applies to intensive margins such as conditional hours worked and log annual earnings. Both men and women work on average about 3 hours less per week and earn less, conditional on working. In almost all cases except conditional hours worked, the point estimates for women are in general higher than for men. While men are 5.6 p.p. less likely to be employed when they provide care to their parents, the decline for women is almost twice as large with a 10 p.p. decline in the employment rate. We also observe a similarly higher decline in women's probability of wage employment (7.9 p.p. vs 5.3 p.p. for men) and annual earnings (22% vs. 17% for men). In contrast, we observe zero impact on the probability of self/casual employment for men and women. This result highlights the importance of flexible work hours in the informal sector.

Table 5. Correlational effect of providing long-term care to parents on employment

	Employed	Wage Employment	Casual/Self Employment	Weekly Hours Worked	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)
Panel A: Male					
Parental Care	-0.056***	-0.053**	-0.001	-3.108***	-0.171**
	(0.018)	(0.022)	(0.022)	(0.996)	(0.084)
Observations	29725	29725	29725	25908	14758
Dep. Var Mean	0.876	0.418	0.458	46.627	7.319
Share of Parent Carer	0.014	0.014	0.014	0.013	0.017
Panel B: Female					
Parental Care	-0.099***	-0.079***	-0.020	-2.709***	-0.228*
	(0.016)	(0.012)	(0.014)	(0.890)	(0.130)
Observations	36519	36519	36519	20284	12067
Dep. Var Mean	0.556	0.276	0.279	39.501	6.994
Share of Parent Carer	0.026	0.026	0.026	0.023	0.028

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, country fixed effect, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, and marital status. Sample includes all individuals aged 40-59 in Poland, Egypt, Indonesia, and Colombia. Log earnings indicate log annual earnings (in USD) conditional on being employed.

Before diving into the results for each specific country, we investigate whether the worse outcomes we observe among women in Table 5 are significant. Table 6 provides the estimates from equation (2) on all four countries combined where we interact our main explanatory variable (LTC) with gender indicator to investigate whether there is a significant impact difference between men and women. Column (1)

through (5) confirms what we already observe in Table 5: there is a larger negative impact on labor supply among women (than men) who provide long-term care for their parents. More notably, we observe a statistically significant differential effect of long-term care on employment, wage employment, and annual earnings between men and women, where the negative effect is less pronounced among males. LTC is associated with a 5.7 p.p. gender employment gap and a 31.5 percent gender earnings gap to women's disadvantage. In contrast, we do not observe meaningful gender differences in the impact on hours worked and self-employment. These results underlie women's disproportionate responsibility to provide LTC and their associated disadvantage in paid employment relative to men. Men's advantage in wage employment also highlights the well-documented observation that women often turn to casual/self-employment, which offers more time flexibility to shoulder the double responsibilities of unpaid care and paid market work.

Table 6. Gender difference on the effect of providing long-term care to parents on employment

	Employed	Wage Employment	Casual/Self Employment	Weekly Hours Worked	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)
Parental Care	-0.087***	-0.087***	0.000	-2.076**	-0.476***
	(0.015)	(0.012)	(0.014)	(0.888)	(0.131)
Male	0.317***	0.150***	0.167***	7.030***	0.676***
	(0.003)	(0.004)	(0.004)	(0.161)	(0.027)
Parental Care * Male	0.057**	0.082***	-0.024	-1.324	0.315**
	(0.025)	(0.026)	(0.025)	(1.332)	(0.155)
Observations	66244	66244	66244	46192	26825
Dep. Var Mean	0.700	0.340	0.359	43.498	7.173
Share of Parent Carer	0.021	0.021	0.021	0.018	0.022

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, country fixed effect, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, and marital status. Sample includes all individuals aged 40-59 in Poland, Egypt, Indonesia, and Colombia. Log earnings indicate log annual earnings (in USD) conditional on being employed.

While the harmonized results are informative, we recognize that there are vast differences in culture, social norms, and gender gap in labor force participation as shown in Figure 1. To investigate how the relationship between parental LTC and labor market outcomes differ in each country, we run equations (1) and (2) separately for each country. Column (1) to (3) in Table 7 presents the results for men for each country, while column (4) to (6) presents the results for women. LTC has a negative relationship with labor market outcomes for both men and women in Poland and Colombia. However, the difference in impact on women and men is unclear.

Table 7. Correlational effect of providing long-term care to parents on employment

	Male			Female		
	Employed	Wage Employment	Casual/Self Employment	Employed	Wage Employment	Casual/Self Employment
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Poland						
Long-term care	-0.158**	-0.223***	0.065	-0.174***	-0.169***	-0.005
	(0.076)	(0.062)	(0.067)	(0.041)	(0.038)	(0.030)
Observations	4768	4768	4768	8653	8653	8653
Dep. Var. mean	0.757	0.525	0.232	0.633	0.489	0.144
Share of parent carer	0.008	0.008	0.008	0.014	0.014	0.014
Panel B: Indonesia						
Long-term care	0.010	-0.077	0.089*	-0.032	-0.038*	0.008
	(0.023)	(0.048)	(0.050)	(0.027)	(0.020)	(0.029)
Observations	4438	4438	4438	3894	3894	3894
Dep. Var. mean	0.956	0.368	0.586	0.725	0.194	0.527
Share of parent carer	0.021	0.021	0.021	0.076	0.076	0.076
Panel C: Colombia						
Long-term care	-0.156***	-0.064	-0.092	-0.195***	-0.110***	-0.085***
	(0.055)	(0.052)	(0.060)	(0.029)	(0.020)	(0.026)
Observations	15727	15727	15727	19153	19153	19153
Dep. Var. mean	0.885	0.324	0.560	0.565	0.225	0.339
Share of parent carer	0.004	0.004	0.004	0.016	0.016	0.016
Panel D: Egypt						
Long-term care	-0.017	-0.005	-0.010	0.035	0.013	0.023
	(0.023)	(0.032)	(0.028)	(0.028)	(0.022)	(0.020)
Observations	4792	4792	4792	4819	4819	4819
Dep. Var. mean	0.894	0.664	0.228	0.247	0.165	0.082
Share of parent carer	0.049	0.049	0.049	0.050	0.050	0.050

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, country fixed effect, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, and marital status. Sample includes all individuals aged 40-59 in Poland, Egypt, Indonesia, and Colombia.

In Poland, providing LTC is associated with a 15.8 p.p. and 17.6 p.p. decline in employment for men and women, respectively. This decline seems to be driven entirely by the drop in wage employment, which in general has more rigid hours and schedules. The decline in wage employment is also significantly larger among men. In Colombia, both men and women drop out of employment when they provide LTC to their parents, and in contrast to Poland, we observe a larger decline in all types of employment among women compared to men. This larger decline in Colombia than Poland might be attributed to the more egalitarian society in Poland, as shown by the smaller gap in labor force participation from Figure 1. In Indonesia, we observe a transition from wage employment to informal employment among men when they provide LTC suggesting the role of more flexibility in the casual employment sector. However, this

transition is non-existent among Indonesian women, who drop out of the wage employment sector. Meanwhile, the result from Egypt shows that merely the presence of a disabled parent in the household does not have any meaningful impact on labor market outcomes for men and women. The null effect may partly be explained by the fact that having parents who need help with daily activities does not necessarily translate to care provided by adult children. For example, in Indonesia, 7.6 percent of males living with older parents need help with daily activities, but only 2 percent provide care to the parents. Similarly, in Colombia, 3.1 percent of women live with disabled parents but less than half of whom provide care to the parents (Table 2). We also provide evidence of the results on hours worked and earnings for each country. The results are presented in Appendix Table 1.

4.5 How does the intensity of parental care affect the labor supply of men and women

In the previous section, we investigate how the decision to provide long-term parental care affects the labor supply of men and women. However, we acknowledge that there is a large heterogeneity in the intensity/number of hours spent caring for parents per week for each individual. In Table 8, we take a closer look into the relationship between labor supply and the hours spent per week on providing parental care. We exclude Egypt in this harmonized sample because it does not have information on the intensity of parental care in the data. In general, we observe that conditional on providing parental care, women on average provide 0.5-1 hour longer per week in care compared to men. Similar to the previous findings, both men and women experienced a significant decline in both extensive margin of work and weekly hours worked. In general, a 10 percent increase in hours of providing parental care is associated with a 0.4 percentage points and 0.6 percentage points decline in the probability of employment for men and women, respectively. Both men and women also experience fewer hours worked, conditional on being employed. In Panel C, we test whether the difference in the impact of the intensity on labor supply between men and women is significant. Contrary to our hypothesis, we find that the impact on men is slightly higher, indicating that additional time for providing parental care reduces the labor supply of men more than women. One possible explanation for this is the higher composition of men who are employed in formal employment, where there is less flexibility in work schedule. The added responsibility of parental care might drive them to be more likely to drop out of their employment.

Table 8. Correlational effect of care hours to parents on employment

	Employed	Wage Employment	Casual/Self Employment	Weekly Hours Worked	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)
Panel A: Male					
Log Care Hours	-0.039***	-0.050***	0.012	-1.754***	-0.122*
	(0.012)	(0.013)	(0.015)	(0.673)	(0.070)
Observations	25396	25396	25396	22161	12468
Dep. Var Mean	0.875	0.369	0.505	46.356	7.311
Mean Hours Cared	13.496	13.496	13.496	13.386	14.671
Panel B: Female					
Care Hours	-0.055***	-0.041***	-0.014*	-1.348***	-0.112*
	(0.008)	(0.006)	(0.007)	(0.453)	(0.061)
Observations	32890	32890	32890	19955	12265
Dep. Var Mean	0.608	0.289	0.318	39.397	6.845
Mean Hours Cared	14.086	14.086	14.086	14.474	15.886
Panel C: Interaction					
Care Hours	-0.044***	-0.038***	-0.005	-0.965**	-0.217***
	(0.008)	(0.006)	(0.007)	(0.454)	(0.061)
Male	0.265***	0.102***	0.164***	6.679***	0.764***
	(0.003)	(0.004)	(0.004)	(0.167)	(0.028)
Care Hours*Male	-0.026*	-0.025*	-0.000	-1.300	0.132
	(0.015)	(0.014)	(0.016)	(0.815)	(0.092)
Observations	58286	58286	58286	42116	24733
Dep. Var Mean	0.724	0.324	0.399	43.059	7.080
Mean Hours Cared	13.959	13.959	13.959	14.169	15.537

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals aged 40-59 from Poland, Colombia, and Indonesia. Individuals from Egypt is excluded because there is no information on length of parental care. Log earnings indicate log annual earnings (in USD) conditional on being employed.

5. Heterogeneity

5.1 Educational Level

We proceed to observe how educational level interacts with the relationship between labor supply and older parental care. The feminization-U hypothesis suggests that the relationship between female labor supply and education is U-shaped, where it is higher for low and high-skilled women and lower for middle-skilled women (Goldin, 1995). Low-educated women are driven by the necessity to be employed. But as women gain more education—the income effect starts to dominate the substitution effect—women

demand more leisure and drop out from the labor force. As they become highly educated, however, the substitution effect begins to dominate again, with increased opportunity costs of staying out of the labor force.

In Table 9, we observe how an individual's highest educational level interacts with the relationship between long-term care provider/disabled parent and labor supply. The omitted educational level category here is those whose highest level of education is primary school or less. Indeed, we do see that the coefficients make a U-shape for women, where the negative effect is greater in magnitude among women with a "middle" education level (Secondary) than with low (Primary or less) or high (Tertiary). Meanwhile, there is no differential impact on employment based on education level among men. Conditional on working, we also do not see a differential effect of LTC on hours worked by education levels for both men and women. For women, the results suggests that the impact of LTC on earnings is alleviated among tertiary educated women.

Table 9. Heterogeneous effect of long-term care provision by education level

	Male			**Female**		
	Employed	Hours worked/week	Log earnings (USD)	Employed	Hours worked/week	Log earnings (USD)
	(1)	(2)	(3)	(4)	(5)	(6)
Parental Care	-0.044	-3.569*	-0.142	-0.040*	-2.582*	-0.582***
	(0.029)	(1.919)	(0.112)	(0.023)	(1.516)	(0.220)
Parental Care *	-0.026	2.107	-0.239	-0.116***	-0.166	0.285
Secondary educated	(0.040)	(2.365)	(0.177)	(0.034)	(2.218)	(0.302)
Parental Care *	-0.005	-2.104	0.345	-0.077*	-0.272	0.950***
Tertiary educated	(0.046)	(2.590)	(0.217)	(0.043)	(1.903)	(0.315)
Observations	29725	25908	14758	36519	20284	12067
Dep. var. mean	0.876	46.627	7.319	0.556	39.501	6.994
Share of parent carer	0.014	0.013	0.017	0.026	0.023	0.028

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals from Poland, Colombia, and Indonesia, and Egypt. Log earnings indicate log annual earnings (in USD) conditional on being employed.

5.2 Presence of Children

This section tests how the presence of children in the household can affect the relationship between labor supply and providing parental care. Specifically, we test whether there is a differential impact on labor supply among the "sandwiched" generation, where individuals have to take care of both young children and older parents in the household. On one hand, double care responsibility can act as an extra burden for employed adults and encourage the decline in the labor supply. On the other hand, the presence of older children (aged 13-18) can help as a substitute for employed adults to provide parental care in the household.

Table 10 shows that the presence of older children, especially children aged 13-18 in the household helps male adults to stay in their jobs when there is a parental care responsibility. However, we also observe that this presence of older children exacerbates the negative impact on work hours among male adults conditional on working. In contrast, the presence of older children does not affect women's already-heavy parental care burden. Further, we observe a positive interaction between parental care provision and the number of young children aged 0-6. While it's not definitive, one possible explanation for this is that older parents might be able to help out with supervising young children. Another possible explanation is that care burden may exhibit economies of scale, meaning that additional dependents affect women's labor force participation decision to a lesser degree than the first dependent in need of care.

Table 10. Heterogeneous effect of long-term care provision by presence of children in household

	Male			Female		
	Employed	Hours worked/week	Log Earnings (USD)	Employed	Hours worked/week	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)	(6)
Parental Care	-0.092***	-2.027	-0.215	-0.120***	-2.900***	-0.106
	(0.026)	(1.360)	(0.142)	(0.020)	(1.081)	(0.157)
Parental Care * # children age 0-6	-0.009	-0.792	0.056	0.077**	0.019	-0.282
	(0.018)	(1.403)	(0.090)	(0.030)	(1.466)	(0.232)
Parental Care * # children age 7-12	0.028	1.539	-0.032	0.019	1.028	0.059
	(0.018)	(1.307)	(0.093)	(0.027)	(1.753)	(0.251)
Parental Care * # children age 13-18	0.046**	-2.687**	0.063	-0.003	-0.271	-0.167
	(0.021)	(1.342)	(0.094)	(0.024)	(1.538)	(0.225)
Observations	29725	25908	14758	36519	20284	12067
Dep. var. mean	0.876	46.627	7.319	0.556	39.501	6.994
Share of parent carer	0.014	0.013	0.017	0.026	0.023	0.028

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals aged 40-59 from Poland, Colombia, and Indonesia, and Egypt. Log earnings indicate log annual earnings (in USD) conditional on being employed.

6. Robustness Check

6.1 The presence of adult household members

In this section, we test how sensitive and whether the relationship between LTC and labor supply will change with the presence of adult men/women in the household. Specifically, the hypothesis here is that the presence of adult women in the household may help other women participate in the labor market by mitigating the care burden, but the presence of adult men may reduce that probability due to gender stereotypes where men are more expected to get into the labor force. In this section, we test whether including the number of adult males and adult females in the household would change the relationship between LTC and labor supply for both men and women.

Table 11 presents our results. Columns (1) and (3) show results from the original specification for males and females, respectively. Columns (2) and (4) show the results including the number of adult males and females in the household to the main specification control variables. The results show that in general, controlling for the number of adult males and adult females does not significantly change our results. However, this table also confirms our previous hypothesis. Among female individuals, the presence of other adult women in the household seems to increase their probability of employment. We also observe that the presence of male adults seems to diminish the probability of employment among female individuals. This result may be driven by gender-cultural norms, where male adults are more likely to get into the labor force than women.

Table 11. Sensitivity check: including number of adult female/male in households

	Employed			
	Male		Female	
	(1)	(2)	(3)	(4)
Parental Care	-0.056***	-0.056***	-0.099***	-0.099***
	(0.018)	(0.018)	(0.016)	(0.016)
Number of Adult Male in HH		-0.006**		-0.010***
		(0.003)		(0.003)
Number of Adult Female in HH		-0.003		0.007**
		(0.003)		(0.004)
Observations	29725	29725	36519	36519
Mean	0.876	0.876	0.556	0.556
Share of Parent Carer	0.014	0.014	0.026	0.026

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals aged 40-59 from Poland, Colombia, and Indonesia, and Egypt.

6.2 Intensity of Parental Care

Past literature has indicated that the length of caregiving that adults provide has a non-trivial impact on labor supply. Chai et al. (2021) find that only women who provide longer than 8 hours of care per week are negatively associated with labor force participation. Walsh & Murphy (2018) provide similar evidence among those who provide more than 15 hours of care per week in Ireland. To investigate further, we conduct additional analysis looking into how labor supply is differentially affected by the intensity of parental care. To do this, we divide our sample into three categories. First, some individuals do not provide care for their older parents. The second category consists of individuals who provide parental care, but only do so at less than 10 hours per week. The third category is those who provide lengthy parental care of more than 10 hours per week.

Table 12 presents our results. In general, align with the findings in past literature, we find that while there is a negative effect on employment among men and women who provide less than 10 hours

of care per week, the effect is substantially larger among those who provide more than 10 hours per week of care. Moreover, individuals who provide more than 10 hours of care per week also work fewer hours and earn significantly less while this reduction is non-existent among those who are not intensive caregivers. These results indicate that the relationship between parental care and labor supply might not be linear; as the responsibility of caregiving gets larger, the effect on labor supply will get amplified.

Table 12. Correlational effect of intensity of providing long-term care to parents on employment

	Employed	Wage Employment	Casual/Self Employment	Weekly Hours Worked	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)
Panel A: Male					
Care Hours (1-10 Hrs)	-0.086**	-0.066	-0.019	-3.642	-0.136
	(0.039)	(0.047)	(0.049)	(2.359)	(0.253)
Care Hours (>10 Hrs)	-0.117**	-0.190***	0.075	-5.634**	-0.500*
	(0.047)	(0.045)	(0.056)	(2.199)	(0.265)
Observations	25368	25368	25368	22137	12450
Dep. Var Mean	0.875	0.369	0.505	46.367	7.312
Mean Hours Cared	15.506	15.506	15.506	15.684	17.085
Panel B: Female					
Care Hours (1-10 Hrs)	-0.127***	-0.092***	-0.033	-1.503	-0.100
	(0.025)	(0.018)	(0.023)	(1.329)	(0.202)
Care Hours (>10 Hrs)	-0.151***	-0.118***	-0.034	-4.835***	-0.532**
	(0.029)	(0.022)	(0.027)	(1.720)	(0.230)
Observations	32890	32890	32890	19955	12265
Dep. Var Mean	0.608	0.289	0.318	39.397	6.845
Mean Hours Cared	14.086	14.086	14.086	14.474	15.886

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals aged 40-59 from Poland, Colombia, and Indonesia. Individuals from Egypt is excluded because there is no information on length of parental care. Log earnings indicate log annual earnings (in USD) conditional on being employed.

6. Conclusion

The number of global aging populations is projected to increase significantly in the next few years. This surge is expected to be accompanied by an increase in demand for informal care, the majority of which will be carried by women. Because of this, analyzing how parental care differentially affects the labor supply between men and women is imperative in designing policies that could alleviate the forgone labor market opportunities that come with this additional responsibility.

Our main analysis from all four countries confirms that women provide the large majority of parental care. We also observe a negative relationship between parental caregiving and labor supply, with a larger correlation among women. Further analysis also shows a significantly larger effect among intensive caregivers who provide parental care more than 10 hours per week. When looking at specific

countries, the results from Poland and Colombia suggest both men and women who provide parental care are significantly less likely to be employed. In the case where there is no employment change as in Indonesia, unlike women, men transition from formal work to informal work. This paper also shows that merely the presence of a disabled parent in the household is not accompanied by a significant change in labor supply for both genders in Egypt.

We also observe some degree of heterogeneity based on an individual's education level and the presence of young children in the household in terms of the relationship between long-term care and labor supply. This provides us with a glimpse into the evidence of increasing the opportunity cost of parental care among those who are highly educated and how the presence of children affects the relationship between providing care and labor supply.

With this paper's focus on developing countries, we add to the vast literature on the relationship between informal care and labor supply, much of which is conducted in developed countries. While the evidence presented in this paper is not causal, the results presented in this paper contribute to future dialogues about policies to reduce gender imbalance in LTC burden in regions where aging is more prevalent and where the gender gap in labor market participation is particularly large.

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Appendix Tables

Appendix Table 1. Correlational effect of providing long-term care to parents on employment

	Male		Female	
	Hours worked/week (1)	Log earnings (USD) (2)	Hours worked/ week (3)	Log earnings (USD) (4)
Panel A: Poland				
Long-term care	-6.589***	-0.351**	-3.436**	-0.113*
	(2.541)	(0.144)	(1.637)	(0.064)
Observations	3608	2164	5477	3521
Dep. var. mean	43.091	8.514	38.558	8.381
Share of parent carer	0.005	0.007	0.010	0.010
Panel B: Indonesia				
Long-term care	-5.209**	-0.379**	-0.572	-0.265
	(2.267)	(0.190)	(1.625)	(0.181)
Observations	4194	4207	2799	2792
Dep. var. mean	39.070	6.580	34.158	4.878
Share of parent carer	0.017	0.017	0.055	0.055
Panel C: Colombia				
Long-term care	-3.317	0.394	-5.838***	-0.017
	(2.181)	(0.489)	(1.460)	(0.348)
Observations	13912	5650	10816	5094
Dep. var. mean	49.733	7.469	41.714	7.174
Share of parent carer	0.003	0.003	0.011	0.010
Panel D: Egypt				
Long-term care	-2.045	-0.084	-0.843	-0.071
	(1.345)	(0.058)	(1.581)	(0.082)
Observations	4194	2737	1192	660
Dep. var. mean	46.921	7.201	36.301	7.147
Share of parent carer	0.047	0.047	0.073	0.078

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, country fixed effect, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, and marital status. Sample includes all individuals aged 40-59 in Poland, Egypt, Indonesia, and Colombia.

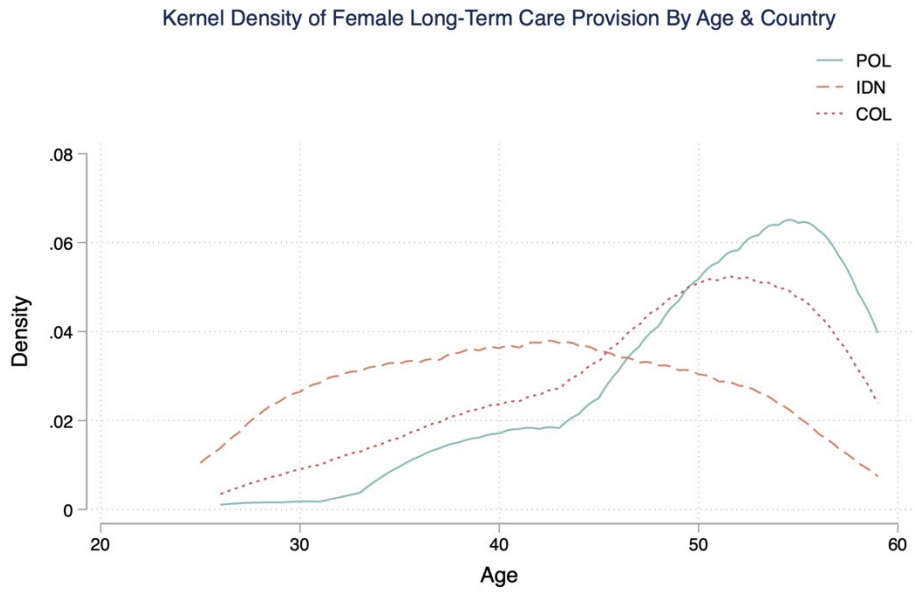
Appendix Table 2. Gender difference on the effect of providing long-term care to parents on employment

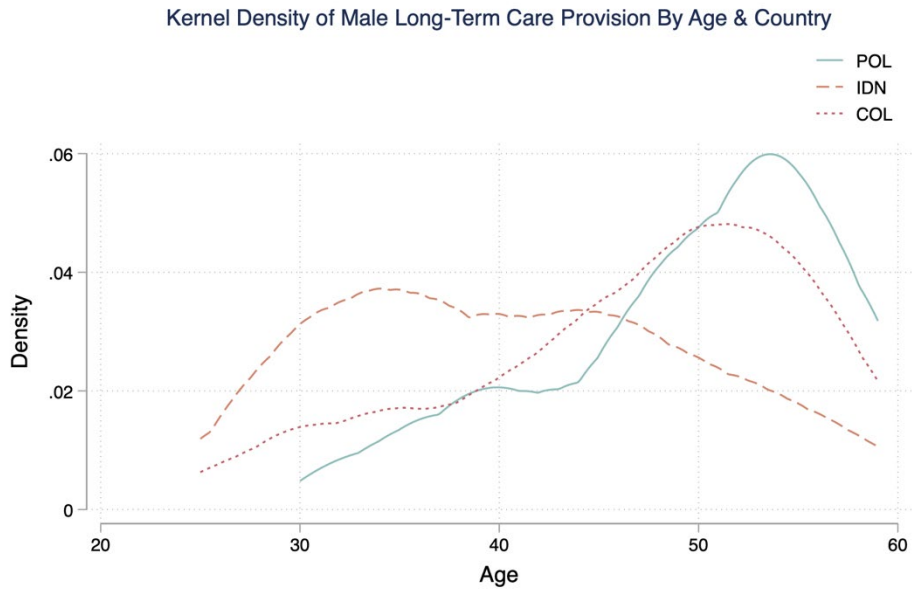
	Employed	Wage Employment	Casual/Self Employment	Weekly Hours Worked	Log Earnings (USD)
	(1)	(2)	(3)	(4)	(5)
Panel A: Poland					
Parental Care	-0.159***	-0.150***	-0.009	-3.544**	-0.099
	(0.041)	(0.037)	(0.030)	(1.652)	(0.065)
Male	0.140***	0.059***	0.081***	4.530***	0.192***
	(0.008)	(0.009)	(0.007)	(0.220)	(0.011)
Parental Care * Male	-0.065	-0.150**	0.086	-3.495	-0.306*
	(0.086)	(0.073)	(0.073)	(3.054)	(0.161)
Observations	13421	13421	13421	9085	5685
Dep. Var Mean	0.677	0.502	0.175	40.358	8.432
Share of Parent Carer	0.012	0.012	0.012	0.008	0.009
Panel B: Indonesia					
Parental Care	-0.022	-0.034*	0.013	-0.599	-0.246
	(0.027)	(0.021)	(0.029)	(1.621)	(0.184)
Male	0.229***	0.151***	0.081***	4.113***	1.589***
	(0.009)	(0.009)	(0.011)	(0.595)	(0.058)
Parental Care * Male	0.005	-0.060	0.066	-4.876*	-0.302
	(0.036)	(0.052)	(0.058)	(2.774)	(0.273)
Observations	8332	8332	8332	6993	6999
Dep. Var Mean	0.848	0.286	0.558	37.104	5.901
Share of Parent Carer	0.046	0.046	0.046	0.042	0.042
Panel C: Colombia					
Parental Care	-0.167***	-0.093***	-0.073***	-5.289***	0.011
	(0.029)	(0.020)	(0.026)	(1.475)	(0.351)
Male	0.329***	0.106***	0.223***	8.179***	0.353***
	(0.004)	(0.005)	(0.005)	(0.212)	(0.049)
Parental Care * Male	-0.068	-0.014	-0.054	0.819	0.296
	(0.064)	(0.056)	(0.065)	(2.620)	(0.598)
Observations	34880	34880	34880	24728	10744
Mean	0.709	0.270	0.439	46.226	7.329
Share of Parent Carer	0.010	0.010	0.010	0.007	0.006
Panel D: Egypt					
Parental Care	0.049*	0.020	0.030	-0.529	-0.109
	(0.029)	(0.023)	(0.020)	(1.566)	(0.077)
Male	0.610***	0.450***	0.158***	10.902***	0.186***
	(0.009)	(0.010)	(0.008)	(0.574)	(0.027)
Parental Care * Male	-0.087**	-0.039	-0.047	-1.810	0.024
	(0.037)	(0.039)	(0.033)	(2.051)	(0.096)
Observations	9611	9611	9611	5386	3397
Dep. Var Mean	0.570	0.414	0.155	44.571	7.191
Share of Parent Carer	0.049	0.049	0.049	0.051	0.050

Notes: Robust standard errors in parentheses. *, **, *** indicate statistical significance at 10%, 5%, and 1%, respectively. Each regression includes individual and household-level characteristics: individual age, age-squared, highest educational level, number of children aged 0-6, 7-12, and 13-18 in the household, country fixed effects, and marital status. The regression includes individuals aged 40-59 from Poland, Colombia, and Indonesia.

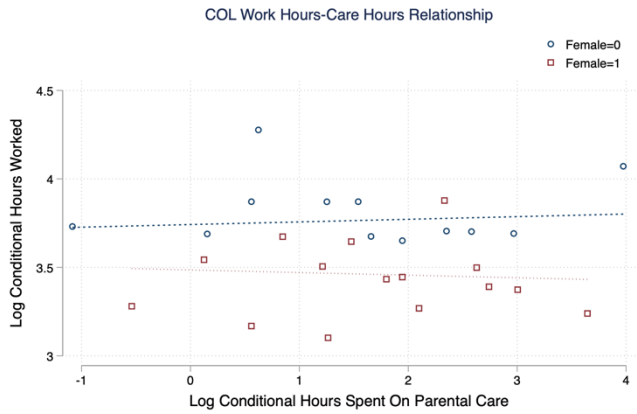
Appendix Figures

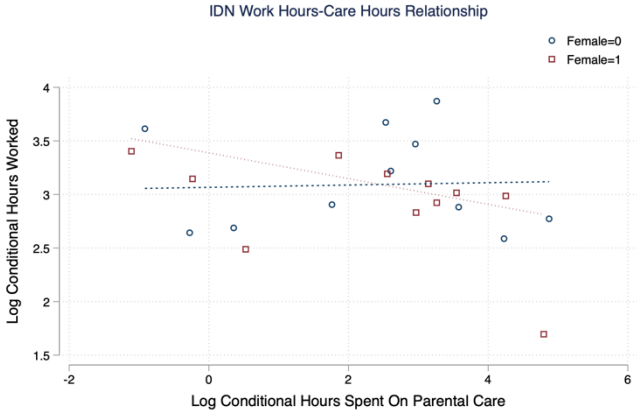
Appendix Figure 1. Kernel density of long-term care provision by age and country

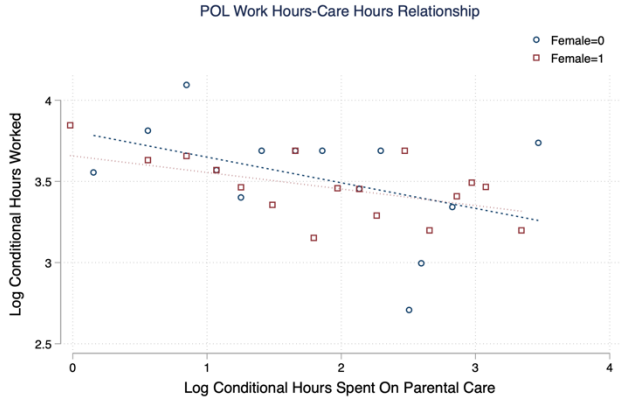




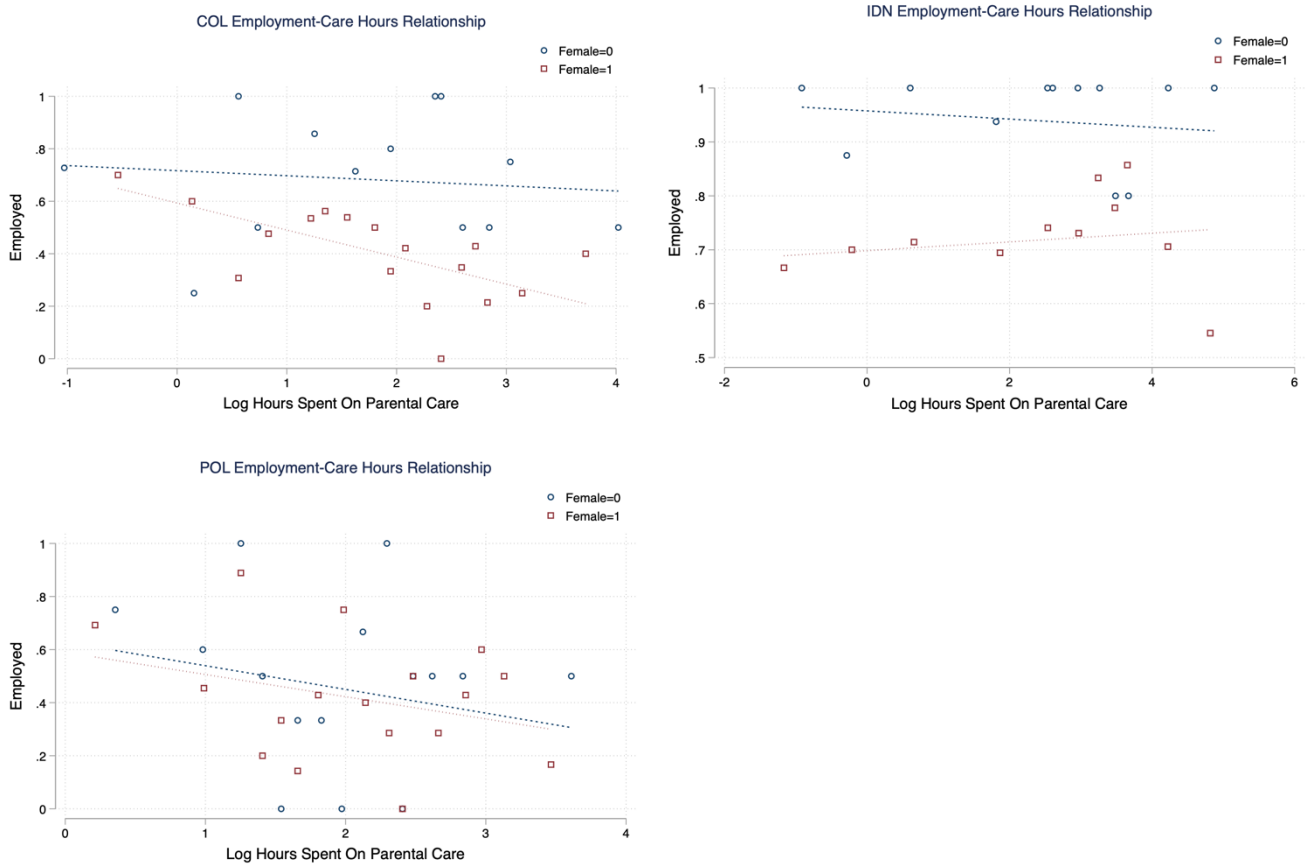
Appendix Figure 2. Work hours and care hours gradient



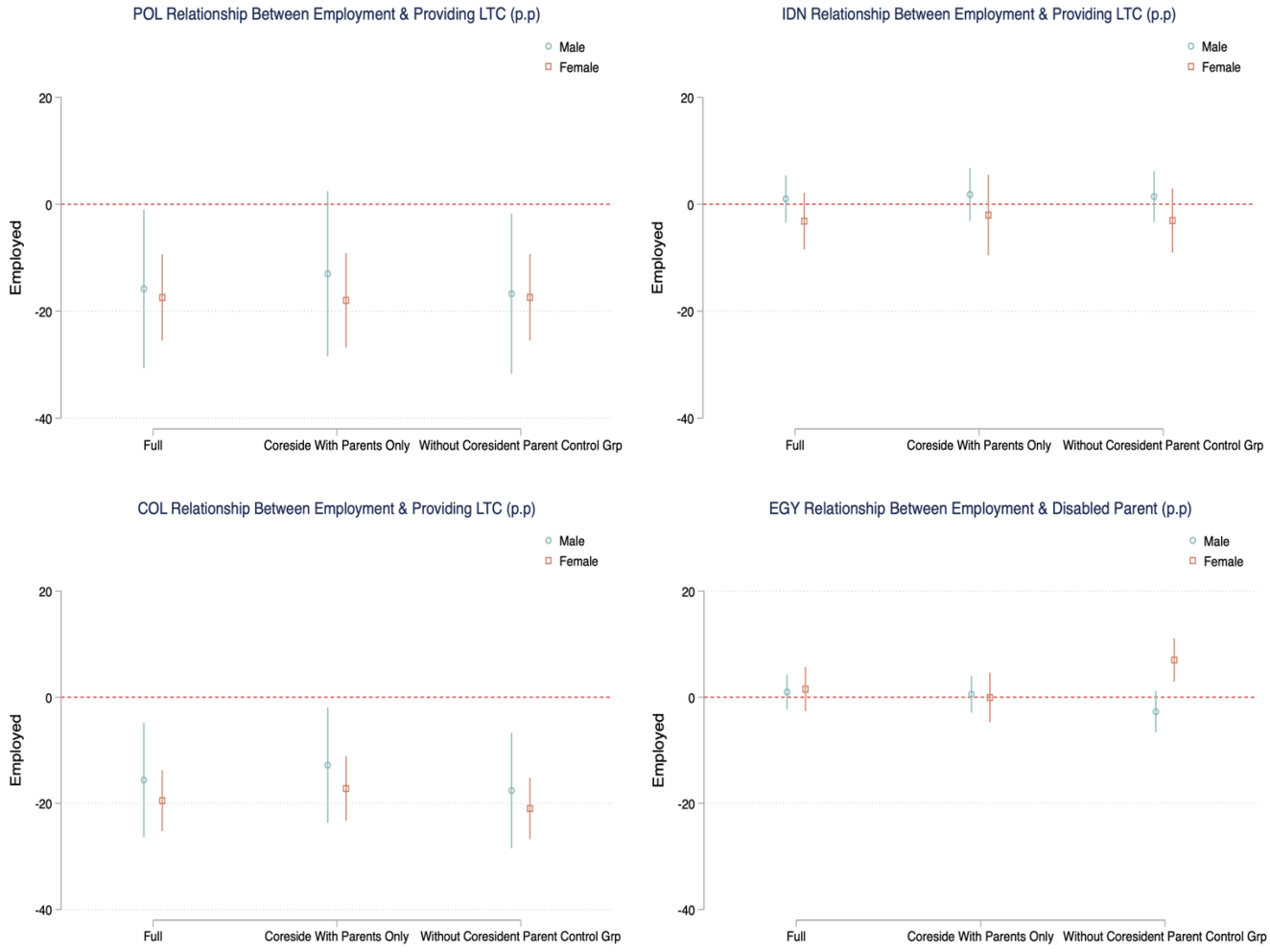




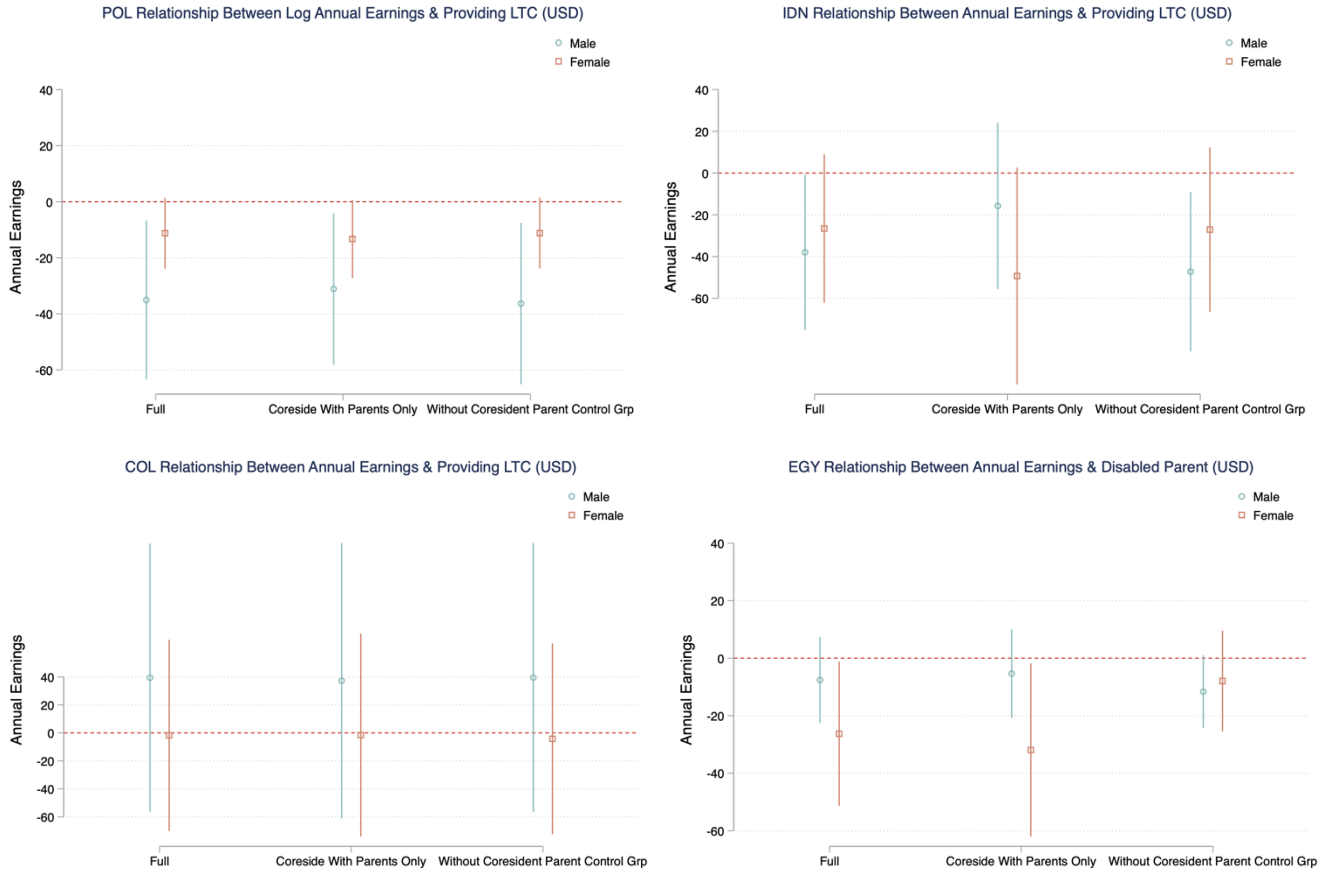
Appendix Figure 3. Correlation between time spent on long-term care and employment



Appendix Figure 4. Correlational effect of providing long-term care on individual employment by choice of control group



Appendix Figure 5. Correlational effect of providing long-term care on annual earnings by choice of control group



Appendix Figure 6. Correlational effect of providing long-term care on work hours by choice of control group