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The socioeconomic within-gender gap in informal caregiving among middle-aged women: Evidence from a Japanese nationwide survey

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ABSTRACT

Caregiving to older people with needs has been mainly dependent on informal care provision by female caregivers. Compared with the care burden gender gap, the within-gender gap in women's socioeconomic status (SES) has attracted less policy attention. We investigated the association between middle-aged women's SES and the likelihood of being a primary caregiver for elderly informal care, focusing on household income, women's marital status, work status, and educational background under the universal and public system of formal long-term care provision in Japan. We used repeated cross-sectional data from nationally representative household surveys conducted between 2010 and 2013 to obtain a sample of 2399 women aged between 40 and 60 years living in the same household as a care recipient. We conducted multiple logistic regression analysis to obtain odds ratios of being a primary caregiver in the household regressed on women's SES variables, adjusting for the characteristics of care recipients and household composition. The results showed that single women with lower education were likely to be primary caregivers when the care recipients had severe levels of care needs, whereas the association was null in the case of care recipients with milder conditions. The results indicated that women's low education and non-married status were related to a higher likelihood of becoming a primary caregiver of severely disabled elderly for reasons other than lower economic power.

To emancipate socioeconomically vulnerable women from the care burden, a broader set of social, economic, and welfare policies are needed.

1. Introduction

Caregiving to older people with needs has been mainly dependent on informal care provision by female caregivers. A recent meta-analysis of 229 studies reported that 69% of informal caregivers are women, and that there is a gender gap in the number of caretakers and the hours spent caretaking (Pinquart and Sörensen, 2006). This gender-biased burden of caregiving may result from traditional norms about gender roles (Ikegami, 1997; Tokunaga et al., 2015), gender-specific skills for caring (Allen, 1994), or the wage gender gap in the labor market (Heimueller and Inglis, 2006).

To relieve and equalize the burden of care in the household (Pinquart and Sörensen, 2006; Tokunaga et al., 2015), some countries, including Japan, have introduced a long-term care insurance (LTCI) system to provide formal care services with affordable copayment (Ikegami, 1997; Campbell and Ikegami, 2003) that at least partially increases women's participation in the labor market (Shimizutani et al., 2008). However, a gender gap remains, because women in lower income households do not enjoy such benefits.

The within-gender gap in socioeconomic status (SES) has been poorly studied in relation to informal caregiving. Most previous studies focusing on gender disparity in informal care provision have ignored the SES gap for caregivers (Lee et al., 1993; Jenson and Jacobzone, 2000; Kramer and Lambert, 1999; Mathiowetz and Oliker, 2005; Ingersoll-Dayton et al., 1996; Dahlverg et al., 2007; Montgomery, 1992; Hourven et al., 2013). Gender and SES as represented by income, occupation, and educational attainment are conceptually independent (Baxter and Taylor, 2014; Danesh et al., 1999; Dutton et al., 2005; Krieger et al., 1997), but are intertwined in the social stratification of life chances (Krieger, 2014). Women have a greater risk of low income, low educational attainment, and limited opportunities to access resources such as healthcare (Miech et al., 2003; Griffin and Hu, 2015; Greenstein,

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2000; Stevenson and Wolfers, 2009; Stewart et al., 2007; Blundell et al., 2013; Wolf and Soldo, 1994; Benham, 1974).

Therefore, women of low SES may face a greater risk of a biased care burden, because they lack resources to buy formal care, have less social support, and/or their lack of labor force skills leaves them little choice but to remain in the household and provide informal care. Such an intertwined impact of gender and SES on the distribution of informal care burdens deserves policy attention to design welfare programs for fair contribution and compensation of informal care in society. It is important to focus not only on the gender gap, but also on disparity within women. We are not aware of any literature that directly addresses the socioeconomic within-gender gap in informal caregiving among women.

The aim of this study was to examine the association between women's SES and the likelihood of being a primary caregiver for older people in need. We focused particularly on household income, marital status, work status, and educational background among women.

2. Subjects and methods

2.1. Data source

The public insurance system has been the dominant source of formal long-term care (LTC) in Japan since 2000 (Ikegami, 1997). The eligibility of access to formal care is based solely on a functional assessment of the recipient through a standardized protocol, regardless of a household's demographic and SES conditions, and copayment is reduced or exempted for low-income households. We believe that the investigation of the within-gender gap in informal care provision under public LTC provision in Japan will help to identify a gap attributable to women's status in the household, regardless of whether the household can afford LTC.

For this study, we utilized data from the Comprehensive Survey of Living Conditions of the People on Health and Welfare (CSLCP), a nationwide, representative, population-based cross-sectional survey of households that is conducted every 3 years by the Ministry of Health, Labour and Welfare in Japan. We pooled data from the 2010 and 2013 surveys to obtain a sufficient sample size for analysis. We limited the data to 2010 and 2013 because information regarding educational attainment was available only for these survey years. The 2010 survey used a probabilistic sampling of about 5500 sampling area units stratified by 47 prefectures in Japan. All households in the sampled unit were invited to participate in a self-administered questionnaire survey on household sociodemographic conditions and health status, educational status, marital status, and work status of household members. In 2500 randomly selected area units from the original sample, an additional questionnaire was distributed to all households with a member who was officially approved as eligible for public LTC at the time of the survey. Information collected included formal LTC service use, informal caregiving, and functional conditions of care recipients.

These anonymous secondary data have been approved for research use by the appropriate governmental agency, and the need for ethics research committee approval has been waived.

2.2. Subjects and sampling

We needed to define the “population at risk,” or those who could potentially be both an informal caregiver in the household and part of the labor force in the formal labor market. To focus on the within-gender gap, we excluded male subjects from our analysis. We further limited our sample to females aged between 40 and 60 years, because women in this age range are most likely to be involved in personal care (mainly of their elderly parents) but can be still part of the labor force (Kramer and Lambert, 1999; Attias-Donfut et al., 2005; Pavalko and Arits, 1997). We excluded women older than 60 years, the age of public pension eligibility, because they were likely to be retired, and to be involved in caregiving of their elderly spouses/parents regardless of SES.

In 2010, the original survey included 228,864 households and 609,018 subjects from 5510.

sampling units in 47 prefectures in Japan (household response rate = 79.1%). Among those aged ≧65 years, 13% reported they needed any type of care attention/support in their daily activities, and about 70% actually applied to and were approved as eligible for the LTC services. There were 7192 households eligible for the LTC survey, of which 5912 households provided valid responses. Because the survey only collected detailed information of caregivers living in the same household as a care recipient, we limited our analysis to 2980 households in which care recipients cohabited with primary caregivers in the same household, and also excluded cases where a professional home helper was the primary caregiver.

We excluded 59 households in which the caregiver cared simultaneously for more than two care recipients. Consequently, 1103 households containing 1181 women aged 40–60 years of working age were available as a target sample for further analysis. We conducted similar procedures for the 2013 data; we appended the datasets to obtain 2399 female subjects in 2236 households.

2.3. Measurement

2.3.1. Target variable

Our target variable is a dichotomy of being a primary caregiver for the cohabited elderly with care needs, based on the questionnaire asking who is the primary caregiver of the frail elderly in need in the household.

2.3.2. Female family member characteristics

We considered female family members' characteristics, including age (age <50 or ≥50 years), marital status (whether currently married) (Wolf and Soldo, 1994), and health status (any chronic diseases under treatment). Job status (full-time job, part-time job, no job) (Johnson and Lo Sasso, 2004), and educational attainment (“junior or high school degree,” “community college or training graduate,” and “university graduate or above”) were counted as indicators of individual SES.

2.3.3. Care recipient characteristics

We used care recipients' characteristics, such as age, gender, health status and care eligibility level in public LTCI, as indicators of the amount of care required. An eligibility level higher than II indicated those without functional independence, and needing assistance with meals, toileting, bathing, and clothing (Ikegami, 1997; Tokunaga et al., 2015). We divided the functional disability level into severe (Level III, IV, and V) versus mild (Level I and II, and less than Level I).

2.3.4. Household characteristics

The number of household members aged over 18 years living together was included in the analysis, because it should reflect the household capacity for informal care provision. A count of household members under 18 years was also included, because it should reflect conflicting demand for care provision to dependent children in the household. The CSLCP included an independent subsample for income data, but the LTC questionnaire subsample did not provide this information. We therefore had to estimate household income using a set of household variables common to both subsamples. Using the subsample for income data collection, the household income (sum of labor and pension income) of

households with subjects aged ≧65 years was regressed on the adult equivalent for household size, type of public pension, the number and types of household members in paid work, house ownership, monthly household expenditure, the number of people aged ≧65 years in the household, and average prefectural household income. The obtained regression formula was applied to the LTC survey subsample to impute household income. The income was log-transformed for regression analysis and the imputed numbers were then converted back to normal numbers, and adjusted using the consumer price index for each survey year to enable comparisons over time. The imputed household income was further divided by the square root of the number of household members to obtain equivalent household income, and then categorized into quintiles (Tokunaga et al., 2015)."

2.4. Statistical analysis

We compared the demographic, socioeconomic, and health status of women in a primary caregiver role and those not in this role using t tests and chi-square tests as appropriate. We also compared by women's status as primary caregiver the characteristics of cohabiting care-recipients and their households. Then, we conducted multivariable logistic regressions of the status of a primary caregiver as a target variable, regressed on women's SES, and adjusted for care recipient and household characteristics (e.g., care level, gender, chronic disease under treatment, household composition, and equivalent household income). As the likelihood of one being a primary caregivers may be differentially affected by the severity of care need. Therefore, tests for a statistical interaction between care eligibility level of the care recipient and the primary caregiver's characteristics such as education or marital status were conducted by entering an interaction term for the recipient's care eligibility level (mild and severe) and the caregiver's education/marital status in a multivariate regression model. From this, we found a significant interaction of education/marital status, and analysis was stratified by care eligibility level. Statistical significance was set at $p < 0.05$. The results from the multivariate analysis were expressed as odds ratios (OR) with 95% confidence interval (CI).

3. Results

Table 1 shows the characteristics of female members, care recipients, and households by caregiving status. All 982 women not in a primary-caregiving role cohabited with other caregiving family members, most of whom were women older than 60 years or younger than 40 years (not shown in the table). Primary-caregiver women were on average 3 years older than their counterparts ($p < 0.0001$) and more likely to have chronic conditions ($p = 0.0001$). Primary-caregiver women were more likely to have a high school education or lower and to be non-workers. Finally, they were more likely to cohabit with care recipients who were older, female, and with mild care needs. One-quarter of primary-caregiver women belonged to the lowest household income quartile.

Table 2 shows the results of multivariable logistic regression analysis with primary caregiving status as an outcome. Younger age, full-time work status, and married status were significantly related to the status of not being in a primary caregiving role, whereas education was not significantly related to caregiving status (model 1). However, after including an interaction term between education and care recipient care levels, the interaction was significant (log-likelihood ratio test $p = 0.0003$); high school education or lower was significantly related to the likelihood of being a primary caregiver ($p = 0.0001$). Marital status also showed a significant interaction with care eligibility levels (log-likelihood ratio test $p = 0.015$, not shown in the table).

Table 3 shows the results of ad-hoc analysis stratified by care recipient's care eligibility level. In both groups, younger women and those who worked were less likely to be primary caregivers. Substantially different patterns were observed for marital status and educational attainment. In the case of care recipients with mild eligibility levels, marital status and educational attainment were not significantly related to the likelihood of being a primary caregiver. In contrast, when care recipients had severe levels of care needs eligibility, married women were significantly less likely to be a primary caregiver (OR = 0.41, 95% CIs = 0.27–0.64). Women with lower educational attainment showed a significantly greater likelihood of being a primary caregiver (OR = 1.94, 95% CIs = 1.37–2.74 for women with junior or senior high school degrees compared with university graduates).

4. Discussion

To the best of our knowledge, this study is the first to empirically investigate within-gender socioeconomic inequality among women in sharing the care burden of older people in need. We found that younger women and those in work were less likely to be primary caregivers. Lower education and being single were significantly related to the likelihood of being a primary caregiver only when cohabiting care recipients had severe care eligibility levels.

The lower likelihood for younger and working women to be primary caregivers is not surprising, and may not be causal. To maximize household welfare production, a household must decide how to allocate the available human resources to market-based production for earning and household production of consumption (e.g., care for children and older people in need) (Van Houtven et al., 2012; Penrod et al., 1995). Younger women and those in work may tend to join the formal labor market to earn, and their counterpart women in the household may accept the role of caring for family members with needs. As we did not observe any difference in this trend regardless of care recipients' care need levels, these household decisions probably were not dependent on the amount of care burden.

Women with lower education and those who were single were likely to be primary caregivers of care recipients with severe care levels, but these factors were not significantly associated with caring for recipients with mild conditions. Women's higher education and married status were related to higher household income levels, which may have led a greater capacity to purchase formal institutional care for severely disabled care recipients. However, the private market of institutional long-term care is still young in Japan, and care for frail elderly is mainly provided through public sectors under a long-term care insurance scheme, where service eligibility is strictly dependent on the elderly's functional levels and estimated needs of care. Women's lower education and non-married status remained significant after controlling for household's income levels. The results indicate that women's low education and non-married status were related to a higher likelihood of becoming a primary care giver of severely disabled elderly for reasons other than lower economic power.

Being female, low educational attainment, and being single are known to be associated with a lack of power within the household (Penrod et al., 1995; Cunningham, 2001). Women with less education and those who are single will face difficulties in negotiating with other family members (both males and females) who should carry the main burden of care. When the care burden is expected to be heavy, the negotiation and dynamic relationships among women in the household may lead to a serious conflict, and women with less negotiating power may be forced to accept the burden of

Table 1
Characteristics of female family members, care recipients, and households by females' caregiving status; 2010 and 2013.

Characteristic	All(N = 2399)		Women not in a primary caregiving role(N = 982)		Primary-caregiver women(N = 1417)		P value
Caregiver characteristics		%		%		%	
Mean age(years)	51.84 ± 5.35		50.10 ± 5.62		53.06 ± 4.80		<0.0001
With chronic disease	999	(41.6)	364	(37.1)	635	(44.8)	0.0001
Work							
Full-time	917	(38.2)	437	(44.5)	480	(33.9)	
Part-time	1115	(46.5)	450	(45.8)	665	(47.0)	<0.0001
No job	367	(15.3)	95	(9.7)	272	(19.1)	
Marital status							
Married	2108	(87.9)	877	(89.4)	1231	(86.9)	0.072
Final education							
Junior or senior high school graduates	1075	(44.8)	381	(38.8)	694	(48.9)	
Community college or training graduates	811	(33.8)	350	(35.6)	461	(32.5)	<0.0001
University graduates or above	513	(21.4)	251	(25.6)	262	(18.6)	
Care recipient's characteristics							
Age (years)							
Mean ± SD	83.65 ± 6.39						
Gender							
Male	738	(30.7)					
Female	1661	(69.3)					
Chronic disease under treatments							
Yes	834	(77.6)					
Independence level							
Mild	1074	(44.7)					
Severe	1325	(55.3)					
Household characteristics							
Size_adjusted household income							
1 st quintitle(<=3 million of yen)	571	(23.8)					
2 nd quintitle(3–4 million of yen)	565	(23.5)					
3 rd quintitle(4–6 million of yen)	563	(23.5)					
4 th quintitle(6–9 million of yen)	455	(19.0)					
5 th quintitle(>=9 million of yen)	244	(10.2)					

Abbreviations:SD: standard deviation.
Difference between non-primary-caregivers and caregivers; p values from χ^2 (categorical variables) or *t*-test (continuous variables).

Table 2
Characteristics of female family members that predict the primary caregiving status; results of multivariate logistic regression.

Parameter	DF	**Model1**			**Model2**		
		Estimate	SD	Pr > ChiSq	Estimate	SD	Pr > ChiSq
Age(years)							
Age1 (=>40, <50)	1	−0.75	0.12	<0.0001	−0.76	0.12	<0.0001
Age2 (=<50, =<60)	0	(Reference)			(Reference)		
Final education							
Junior or senior high school degree	1	0.36	0.13	0.053	0.65	0.17	0.0001
Community college or training graduates	1	0.19	0.13	0.15	0.25	0.17	0.13
University graduates or above	0	(Reference)			(Reference)		
Marital status							
Married(Yes:1, No:0)	1	−0.51	0.16	0.0012	−0.50	0.16	0.0017
Chronic disease under treatment							
Yes	1	0.12	0.10	0.26	0.11	0.10	0.25
Work							
Full-time	1	−0.92	0.17	<0.0001	−0.92	0.17	<0.0001
Part-time	1	−0.61	0.18	0.0007	−0.60	0.18	0.001
No job	0	(Reference)			(Reference)		
Interaction: Two-way							
Junior or senior high school degree*mild level	1				−0.67	0.27	0.011
Some college*mild level	1				−0.18	0.28	0.52
University graduates or above*mild level	0				(Reference)		
Recipient care level:mild level	1	0.31	0.10	0.0018	0.68	0.22	0.0021
Recipient care level:severe level	0	(Reference)			(Reference)		

Adjusted for annual dummy, recipients' age, care level, gender, chronic disease under treatment, household composition, and equivalent household income. N = 2399, 1417 of whom were primary caregivers.

being a primary caregiver (Conlon et al., 2014).

Educational level is a major determinant of the value of an individual's time in the labor market (Gronau, 1973). Women with less education have a lower market value in the formal labor market, are less likely to be accepted in the labor force, and are more likely to remain in the household. In addition to a gender-

Table 3
Results of multivariate logistic regression analysis stratified by care recipient's care level.

Mild Level			Severe Level		
	Odds ratio	95%CI		Odds ratio	95%CI
Primary caregivers'characteristics			**Primary caregivers'characteristics**		
Age(years)			Age(years)		
Age1 (=>40, <50)	0.61	(0.43–0.86)	Age1 (=>40, <50)	0.41	(0.29–0.56)
Age2 (=<50, =<60)	1.00	(Reference)	Age2 (=<50, =<60)	1.00	(Reference)
Chronic disease under treatment			Chronic disease under treatment		
(Yes:1, No:0)	1.24	(0.87–1.55)	(Yes:1, No:0)	1.04	(0.78–1.37)
Work			Work		
Full-time	0.46	(0.28–0.76)	Full-time	0.36	(0.23–0.55)
Part-time	0.67	(0.40–1.17)	Part-time	0.46	(0.28–0.74)
No job	1.00	(Reference)	No job	1.00	(Reference)
Marital status			Marital status		
Married(Yes:1, No:0)	1.02	(0.65–1.60)	Married(Yes:1, No:0)	0.41	(0.27–0.64)
Educational attainment			Educational attainment		
Junior or senior high school graduates	1.00	(0.67–1.49)	Junior or senior high school graduates	1.94	(1.37–2.74)
Community college or training graduates	1.05	(0.69–1.62)	Community college or training graduates	1.29	(0.92–1.86)
University graduates or above	1.00	(Reference)	University graduates or above	1.00	(Reference)

Adjusted for annual dummy, recipients' age, care level, gender, chronic disease under treatment, household composition, and equivalent household income. Mild level: N = 1074, 692 of whom were primary caregivers. Severe level: N = 1325, 725 of whom were primary caregivers.

biased wage difference, our results strongly suggest that a within-gender difference in educational background leads to a biased allocation of care burden for those with lower educational attainment.

The informal care of frail elderly people in the household is a non-market activity with a shadow price. Some studies estimate that this price is not low (Posnett and Jan, 1996). Our results suggest that the shadow price of informal caregiving is distributed in a biased way to women with less power in the household system, and that the inequality is not fully solved by public provision of formal care to supplement informal caregiving.

Countries such as Germany and South Korea have introduced a cash benefit to financially compensate informal caregivers. Following extended consideration, the Japanese system has not introduced this cash benefit after concluding that it may bind women to the role of informal caregiver in the household (Campbell et al., 2010; Long, 2004). Other countries such as the UK and Australia have prepared legal protection of caregivers, and provided formal care to support them psychologically and financially (Nolan et al., 1996; Arksey, 2002; Victorian Government Department of Human Services (2005); Hervey, 2004; Gilles, 2000). However, the limited opportunities in the labor market and for social participation among socially and economically vulnerable women, who are likely to be bound to informal care in the household, may result in further disadvantages, such as poorer pension eligibility, lack of worker compensation, and deregulation in working hours and other health/safety protection. Thus, policy making for formal and informal care provision should acknowledge the inequality in care burden and the social inequality in health and socioeconomic conditions among women. This would help to reduce injustice through a broader set of social, economic, and health policies by empowering these women.

Although the major strength of this study is the use of nationally representative population-based data with high coverage, we should acknowledge several limitations. First, this was cross-sectional data, so we cannot draw conclusions about causality: a woman with no job might be burdened with informal care or she might resign from her job to become a caregiver. Further research with panel data is needed. Second, caregivers such as daughters-in-law and married daughters have played an important role in informal caregiving arrangements within East Asian traditional norms (Smith et al., 1991; Nishi et al., 2010), which we did not consider in this study because of the lack of relevant data.

5. Conclusion

Using a nationally representative sample of Japanese women of working age in the community, we demonstrated that the burden of informal care for older people in need is distributed unequally to women with lower SES in the household, despite the universally available formal service provision under the public insurance scheme in Japan. These findings suggest that socioeconomic inequality, in addition to gender-related bias, contributes to the disproportional distribution of the care burden to women with low skills, resources, and power. Policy making should acknowledge the need for a broader set of social, economic, and welfare approaches to emancipate socioeconomically vulnerable women from the shadow cost of informal care for older people.

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