Title: Care poverty among older adults in East Asia: A comparison of unmet care needs between China and Taiwan

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Care poverty among older adults in East Asia: a comparison of unmet care needs between China and Taiwan

Abstract

Purpose: Applying the concept of care poverty and Andersen's Behavior Model, this study compares the patterns of unmet long-term care needs and investigates the association between unmet needs and the depression and life satisfaction of older adults aged ≥ 65 in China and Taiwan that belong to the same East Asia welfare model.

Methods: Data come from the 2015 China Health and Retirement Longitudinal Survey (N = 6,341) and the 2015 Taiwan Longitudinal Study on Ageing (N=4,588).

Results: Older adults in China and Taiwan differ significantly in terms of demographic and socioeconomic characteristics. The care poverty rate in activities of daily living (ADL) in these two Asian societies was similar and the rate in instrumental activities of daily living (IADL) was lower in Taiwan than in China. Regression analyses showed that unmet care needs were associated with different predisposing and enabling factors between older Chinese (e.g., residential area and marital status) and Taiwanese (e.g., living arrangement and frequency of seeing children) adults, but the association between depressive symptoms and life satisfaction and unmet care needs were highly similar based on comparison of correlation coefficients.

Conclusions: Chinese disadvantaged older adults facing a higher risk of unmet care needs were those who were single and lived in rural areas, while Taiwanese were those who lived alone and had no close relationship with children. Additionally, long-term care services should meet the IADL care needs but not be limited to only meeting ADL care needs in both China and Taiwan.

Keywords: welfare state; long-term care; unmet need; care poverty; Andersen's Behavior Model; comparative study

1. Introduction

China and Taiwan are welfare societies in East Asia (Esping-Andersen, 1996; White & Goodman, 2001), and both cherish the ideals of filial piety and familial responsibility as the central pillar of welfare production (Yeh *et al*., 2013; Solinger, 2015). East Asian welfare systems are often described as "productivist", being more concerned with economic growth than with providing public services and social security for their citizens (Holliday, 2000). Therefore, family care has been the main source of support for older adults both in China (Abrahamson, 2017) and Taiwan (Kröger & Yeandle, 2013).

However, in recent decades, family care and intergenerational co-residence have been decreasing (Lin & Yi, 2013), which is partly attributable to the low fertility rate and integration of women in the labor market (Abrahamson, 2017). Therefore, care provision through the states has been expanded (Hwang, 2012; Choi, 2016; Fleckenstein & Lee, 2017). In Taiwan, migrant care

workers and for-profit providers become alternatives to family care (Chou *et al*., 2015; Yeh, 2020). Despite these changes, caring for older relatives in China and Taiwan, compared with Western societies, remains a familistic welfare regime (Abrahamson, 2017).

Both China and Taiwan are facing rapid population ageing. In China, there are 172 million older adults aged 65 and over, accounting for 12% of the total population. The life expectancy is 80 years old for women and 75 years old for men. It is projected that the number of older adults 65+ will increase by 112%, whereas the number of working adults aged between 20 and 64 will decrease by 17% in the following three decades (United Nations, 2020). Taiwan has an even older population than China. There are 3.8 million older adults aged 65 and over, accounting for 16% of the total population. The life expectancy is 84 years old for women and 78 years old for men. The number of older adults is projected to increase by 108%, whereas the number of working-age adults is projected to decrease by 30% in the following three decades (United Nations, 2020). Making sure that there are sufficient long-term care (LTC) resources for older adults is at the top of the government agenda in both China and Taiwan.

Family care responsibility is explicitly stipulated in the Constitution in China (Hu & Ma, 2018) and in the Civil Code in Taiwan (Wang & Chen, 2017). Following the value of filial piety, older adults live with and are cared for by their adult children, particularly the eldest son and his wife. However, the proportion of older adults living with their children has been decreasing in the last few decades. In 2017, 54% of older adults in Taiwan expected to co-reside with children and

their children's families, but only 34% could (Ministry of Health and Welfare, Taiwan, 2018). Similarly, 51% of older adults in China preferred to co-reside with their adult children, but only 31% did so (Chen, 2019). Such a discrepancy between preferred and actual living arrangements reflects the declining capacity of children to provide care for their older relatives in both China and Taiwan and points to the necessity of the state stepping up its effort in care supply.

Taiwan, an East Asian welfare state, has been called the "reluctant welfare state" (Midgley, 1986) and a country with "high family welfare responsibility" (Lee & Ku, 2007), although it has had a rather universal health care provision since 1995 (Aspalter, 2006). Since the 1990s, local authorities have been obliged to provide formal social services (including community/home-based, institutional and respite care services) that are mostly outsourced to NGOs. Co-payment is required for these services based on the total income of the lineal family and the level of disability. Since 1992, families with a relative needing regular assistance have been eligible to hire a live-in migrant care worker. The numbers have increased year by year, from only 306 in 1992 to 235,961 in 2020 (Ministry of Labor, Taiwan, 2021) (for details, see Chou et al., 2015; Yeh, 2020). The national survey in 2017 showed that the proportion of older adults aged 65 and over who needed help with at least one activity of daily living (ADL) or instrumental activity of daily living (IADL) was 28%. Among these disabled older adults, 67% were cared for by their family members, 17% by a live-in migrant care worker, 6% by staff working in residential settings, and 1% cared for by a home carer (Ministry of Health and Welfare, Taiwan, 2018).

The issue of population ageing in China and the increasing demand for LTC for older adults started to attract government attention in the late 1990s. In 2006, the government laid out its strategy for developing formal care services for older adults living in the community, and the whole sector witnessed a notable increase in government investment afterwards. However, since the government has to build the system from scratch, the capacity of formal community-based services remains limited in most parts of the country, especially in rural areas (Hu *et al*., 2020). Like Taiwan, access to financial support from the government depends on professional needs assessments and means-testing, which means that a large proportion of older adults either rely on family carers or purchase services themselves. Based on a survey of 10 large Chinese cities, 10% of older adults using formal care services receive financial support from the government (Hu *et al*., 2020). In 2016, 15 cities piloted the LTC insurance scheme. The funding of LTC insurance mainly comes from the budget of local governments. Since these are all relatively rich cities and there are great variations in terms of financial capacity between different regions of the country as well as between rural and urban China, it is unclear to what extent the insurance scheme can be more widely rolled out without further financial support from the central government (Feng *et al*., 2020).

Taiwan and China have markedly different political systems, which have profound implications for how LTC policies are initiated, reformed and implemented. Taiwan is characterized by a democratic polity that encompasses political party competition (Fleckenstein & Lee, 2017). To meet older people's growing care needs, the government has launched long-term care programmes,

e.g., a 10-year long-term care scheme named LTC 1.0 between 2008-2018, LTC 2.0 between 2018-2028, and the Long-Term Care Service Act in 2015 (MOHW, Taiwan, 2015). However, the financial resources of these programmes have remained uncertain and limited (Yeh, 2020). In comparison, China is governed by a single-party regime. A shift from a centrally planned economy to a market-oriented economy in the early 1980s led to a drastic reduction in social welfare provision by state-owned or collective enterprises, which meant that the government had to design the LTC policy from scratch.

All in all, both China and Taiwan belong to the same East Asian welfare model, in which older relatives usually rely on their families for care. This family care model has faced the same challenges in both China and Taiwan, e.g., rapid population ageing and a gradual decrease in the number of older people living with their children. Although the formal care systems for older people are still under construction in both China and Taiwan, they are in different stages of LTC policy development. A comparative analysis will provide useful information about the similarities and variations in the patterns of care utilization and care poverty in the East Asian welfare model. To date, there have been no comparative studies that take into account recent changes in LTC policies and current challenges towards the familialist welfare model in China and Taiwan and how they affect unmet care needs of older adults in these two societies. Moreover, it is unknown whether the association between unmet care needs and mental well-being of older people differs or converges in these two LTC systems.

1.1. Conceptual frameworks

As discussed above, whether the care needs of older adults are met or unmet is not only related to their individual and family characteristics but also to public welfare interventions. Negative consequences or adverse outcomes of unmet care needs include physical and mental issues (Allen & Mor, 1997; Desai et al., 2001; Lima & Allen, 2001).

1.1.1. Unmet care needs and care poverty

In gerontology, the concept of *unmet LTC needs* has been used since the 1970s. Since then, many studies have focused on unmet needs including the factors and consequences (e.g., quality of life) of unmet needs in health care and social care/long-term care among older adults in Western and Asian societies (Allen & Mor, 1997; Desai et al., 2001; Zhu, 2015; Iparraguirre, 2020; Meng et al., 2021). However, this area of research has not emphasized that inadequate care is *a social policy issue* or that unmet care needs mean *deprivation of a basic human need*, which can also be seen as *a human rights violation* (Kröger *et al*., 2019) and *care inequality* (Hill, 2021; Sihto & Van Aerschot, 2021). Deprivation of adequate care can be understood as a failure of care policy and of the welfare state. To conceptualize the social policy and inequality dimensions of care reception, the term *care poverty* is used. Care poverty means a situation where, as a result of both individual and structural

issues, people in need of care do not receive sufficient assistance from informal or formal sources and thus have care needs that remain uncovered (Kröger *et al*., 2019). While unmet needs reflect care inadequacy at the individual level, care poverty is a manifestation of unmet care needs at the population level.

According to Kröger (2022), an individual person has difficulties in performing ADLs (basic everyday activities such as eating, dressing and toileting); therefore this individual has personal care needs. When these needs are not met for an individual, the person is situated in personal care poverty. This situation brings the individual's health and well-being under threat. When a person has difficulties to perform the IADLs (shopping, cooking, doing housekeeping, taking medicine and managing bills), it therefore shows that this person has practical care needs. When these needs are not met for an individual, the person is situated in practical care poverty, which influences negatively her/his quality of life. The *care poverty rates* in I/ADLs are measured by the proportions of people who had unmet needs out of all those who had care needs in their I/ADLs (Kröger et al., 2019).

1.1.2. Factors associated with unmet needs

The Andersen model (Andersen, 1968, 1995) has been used by several studies on older adults' utilization of health and LTC services (Ozawa & Tseng, 1999; Bradley *et al*., 2002; Fu *et al*., 2017). According to this model, needs are the most immediate reasons for using long-term care.

Previous studies have used functional disability, chronic illness, and self-reported health to gauge LTC needs (Schure et al., 2015; Blake et al., 2017; Hu & Wang, 2019; Meng et al., 2021). The predisposing factors are the individual-level characteristics which affect care utilization prior to the onset of LTC needs. They include age (e.g., older), marital status (single), and gender (female). In an ethnically diverse society, ethnicity is also an important predisposing factor (McGarry et al., 2014). The enabling factors refer to the resources and know-how that facilitate care utilization. In unmet needs research, they can be further divided into two groups: social support networks and socioeconomic status (Ozawa & Tseng, 1999; Fu et al., 2017). Indicators of social support networks include living arrangement (alone), relationships with caregivers, and caregivers' age and health, whereas socioeconomic factors include living area (rural), income, and educational achievement. We used *Andersen's* behavioral model as a reference to structure our research and to examine the applicability of this model in unmet care needs in ADL and IADL among older people.

1.1.3. Unmet needs and health outcomes

Onset and progression of functional limitations not only lead to care needs but are also highly stressful events for older adults, as they greatly limit older adults' autonomy and cause major disruption in their daily lives. Long-term care compensates for a decline in functional capability and represents crucial resources for older adults to cope with the stress associated with care needs (Verbrugge & Jette, 1994). Without adequate care, older adults with care needs are fully exposed to the negative consequences of functional declines. Existing research suggests that unmet care needs

may lead to mortality (He *et al*., 2015), progression of disability (Hu & Li, 2020), early admission to care homes (Gaugler *et al*., 2005), depression, and reduction of quality of life (Allen & Mor, 1997; Desai et al., 2001; Lima & Allen, 2001; LaPlante et al., 2004). In this study, we focus on the relationships between unmet care needs and mental well-being of older adults.

This study aims to answer four inter-related research questions: (1) What are the similarities and differences in older adults' socioeconomic and demographic characteristics between China and Taiwan? (2) In terms of care poverty, what are Chinese and Taiwanese older people's care poverty rates in ADL and IADL? (3) To what extent are predisposing, enabling and need factors significantly associated with unmet care needs in Chinese and Taiwanese older adults, and how does the association differ between them? (4) Are unmet care needs correlated with older adults' mental well-being, and how do the correlations differ between China and Taiwan?

2. Method

2.1. Data

The Chinese part of the study used data from the China Health and Retirement Longitudinal Survey (CHARLS), which collected ageing and health-related information from a nationally representative sample of people aged 45+. The analyses focused on 6,341 older adults aged 65+ in the third wave of the CHARLS conducted in 2015, and the response rate was 82.1 % (Zhao et al., 2020). We used the harmonized dataset of CHARLS, which was created to facilitate cross-country

analysis. Taiwanese data are based on a sample of 4,588 older adults aged 65+ who participated in the survey of the Taiwan Longitudinal Study on Ageing (TLSA) conducted in 2015, including 2,399 samples from follow-ups since 1989 and 2,189 new recruited samples in 2015 (see Health Promotion Administration, Ministry of Health and Welfare, Taiwan, 2020, for more). The stratified sampling used was based on a household dataset gathered across all local authorities in Taiwan, and the response rate was 80.6 %.

This study has obtained IRB approval (code of IRB: YM109037E) from the university of correspondent author.

2.2. Unmet long-term care needs

In China, participants of the CHARLS were asked about their ability to perform five ADLs (dressing, bathing, eating, moving, and toileting) and five IADLs (doing housework, cooking, taking medication, shopping, and managing money). There were four options: “I have no difficulty doing it”, “I have difficulty but still can do it myself”, “I need help”, and “I cannot do it”. The latter two options were treated as having a care need. For each task, respondents were asked whether they received help. Those who reported a care need but did not receive help were treated as having unmet needs with respect to this task. We added up the number of unmet needs for ADL tasks and created a binary variable: 0 = no unmet needs and 1 = one or more unmet needs for ADL tasks. We created a similar variable to measure unmet needs for IADL tasks.

In Taiwan, participants of the TLSA were asked whether they had any difficulties in performing six ADL tasks (bathing, dressing, eating, getting up and standing, moving, and toileting) and nine IADL tasks (shopping, managing money, taking transportation, cleaning, washing, making phone calls, taking medication, cooking, and doing laundry). In this comparative study, we only use the tasks of I/ADLs which appear in both surveys. Therefore, one ADL (i.e., getting up and standing) was deleted; two IADLs (taking transportation and making phone calls) were removed and three IADLs (i.e., cleaning, washing and doing laundry) were merged into one IADL (doing housework). Respondents who reported "no difficulty" were treated as having no care needs in ADL or IADL, while another three answers (somewhat difficult, very difficult or totally incapable) were coded as having care needs in ADL or IADL. Unmet ADL or IADL care needs were only measured for those respondents with care needs as defined above and who replied as "having no person to help" in the question "Who could help to carry on these tasks?" or replied as "need more assistance" in the question "do you think the assistance you receive is sufficient or need to have much more?". Those who answered "enough help" to this question were coded as having care needs met in ADL and IADL.

2.3. Factors associated with unmet needs

The selection of factors associated with unmet needs was based on the behavioral model of care utilization. We investigated the same predisposing, need, and enabling factors in the two

datasets. Predisposing factors included age, gender, and marital status. Age is a continuous variable. Marital status is a dichotomized variable: 0 = married and 1 = never married, widowed, divorced, or separated. Need factors were measured by functional limitations and self-reported health. We investigated ADL limitations and IADL limitations separately. Both variables were coded as continuous variables, and a higher score indicates greater limitations in functioning. Self-reported health was measured on a five-point Likert scale (1 = very good and 5 = very poor).

The enabling factors can be further divided into social support factors and socioeconomic characteristics. For social support factors, we investigated living arrangements and social contact with adult children. The living arrangement variable was dichotomized: 0 = living with someone else in the same household and 1= living alone. The social contact variable had three categories: 1 = seeing children everyday day/living with children, 2 = seeing children every week, and 3 = other circumstances including having no children. We investigated three socioeconomic factors: residential areas (0 = urban and 1 = rural areas), education (0 = primary education or below and 1 = secondary education or above), and receipt of public pension (0 = yes or severance payment and 1 = no).

2.4. Mental well-being

According to Headey et al. (1993), the concept of mental well-being consists of four dimensions: depression, anxiety, life satisfaction, and positive affect. We investigated depressive

symptoms and life satisfaction that are available in both the CHARLS and TLSA. Originally, depressive symptoms in the CHARLS were measured by the 10-item CES-D scale and depressive symptoms in the TLSA were measured by the 11-item CES-D scale. To make our analysis results comparable, we only used the six items in the CES-D scale which are available in both CHARLS and TLSA. The six items are: feeling that doing everything was an effort, sleeping poorly or restlessly, feeling in a bad mood /depressed, feeling lonely, being unable to gather energy to do things/could not get going, and feeling happy. In both datasets, each item was measured on a 4-point scale: 0 = none and 3 = most of the time. We reverse scored one negative statement (i.e., feeling happy) and summed the scores for the items (range: 0-18). A higher score indicates more severe depressive symptoms.

In the TLSA, life satisfaction was measured by a scale with 10 binary items (1= yes and 0= no) in life conditions. To make the measurement of life satisfaction comparable, we only used the item from TLSA “are you satisfied with your life”. Respondents were asked in the CHARLS to rate their satisfaction with life on a five-point scale: 1 = completely satisfied and 5 = not at all satisfied. We recoded the life satisfaction question in the CHARLS into a binary variable: 0=Not satisfied and 1=Satisfied.

2.5. Statistical analysis

We conducted χ^2 tests and F-tests to examine whether there were differences in participants' characteristics, including care needs, between China and Taiwan (Table 1). We compared the care poverty rate in terms of ADL and IADL care needs (Table 2). As discussed above, the *care poverty rate* was calculated as the share of those who had unmet needs among all those who had care needs in their ADLs/IADLs (Kröger et al., 2019). To examine the association between independent variables (predisposing, enabling and need factors) and dependent variables (unmet care needs), logistic regression analyses were conducted (Tables 3–4). To investigate the correlation between mental well-being and unmet care needs, we calculated the Pearson correlation coefficients between unmet needs, depressive symptoms, and life satisfaction while controlling for predisposing, enabling and need factors (Table 5).

3. Results

3.1. Comparing characteristics and level of care poverty in older Chinese and Taiwanese adults

A comparison between older adults in China and Taiwan shows that there were significant differences in terms of age, marital status, living area, education level, receipt of a pension, social contact with children and self-reported health ($p < 0.001$), gender ($p < 0.05$) and proportion of people with ADL or IADL care needs ($p < 0.001$). The findings suggest that compared with older adults in Taiwan, those in China were more likely to be male, have spouses, receive a retirement

pension, and see children every day or live together with children. Older adults in Taiwan are more likely than those in China to be older, live in urban areas, receive secondary or higher education, and report ADL and IADL care needs. There is no evidence to suggest that the two groups differ significantly concerning living arrangements (Table 1).

< Table 1 >

According to the definition of care poverty by Kröger *et al*. (2019) and Table 2, older Chinese adults had a higher proportion of poverty in IADL care than older Taiwanese adults ($p < 0.001$). However, the poverty rate in ADL between these two groups did not show a significant difference.

< Table 2 >

3.2. Factors associated with unmet long-term care needs

Tables 3 and 4 show the results of logistic regression analyses on "unmet ADL care needs" and "unmet IADL care needs", respectively, in China and Taiwan. The regression models were all statistically significant ($p < 0.001$) based on chi-square tests. Based on Andersen's Behavior Model, unmet LTC needs were significantly related to participants' predisposing, enabling and need factors among older adults in China and Taiwan. However, the analyses also showed that the significant variables were different between China and Taiwan.

3.2.1. Unmet ADL care needs

In China, the significant factors associated with unmet ADL care needs were participants' sex (OR= 0.66, $p < 0.05$), residential area (rural vs. urban) (OR= 1.48, $p < 0.05$), level of IADL (OR=0.73, $p <0.001$) and self-reported health (OR= 0.77, $p < 0.01$). Among Taiwanese older people, living arrangements (alone vs. with others) (OR=6.87, $p < 0.01$) and level of ADL (OR= 0.90, $p < 0.05$) were significantly related to unmet ADL care needs. Females, older adults living in rural areas, and those with better IADL functioning or lower levels of self-reported health were more likely to report unmet ADL care needs in China. Taiwanese older adults who were living alone and had better ADL functioning were more likely to report such unmet care needs.

<Table 3>

3.2.2. Unmet IADL care needs

The significant variables related to older Chinese adults' unmet IADL care needs were age (OR = 0.98, $p < 0.05$), marital status (OR = 1.65, $p <.001$), residential areas (OR = 1.36, $p < 0.05$), living arrangements (OR = 1.81, $p < 0.01$), having no pension (OR = 1.35, $p < 0.05$) and level of ADL (OR = 0.85, $p < 0.01$). In Taiwan, unmet IADL care needs were significantly associated with age (OR = 0.96, $p < 0.01$), living arrangement (OR = 2.74, $p < 0.001$), frequency of seeing children per day (OR = 0.28, $p < 0.001$) and per week (OR = 0.49, $p < 0.05$), having no pension (OR = 1.71, $p < 0.05$) and self-reported health (OR = 0.79, $p < 0.05$).

In both China and Taiwan, older adults living alone and having no pension were more likely to have unmet IADL care needs. Meanwhile, both older Chinese and Taiwanese adults who were

older were less likely to have unmet IADL care needs. Among older Chinese adults, those who were single, lived in rural areas, and had better ADL functioning faced a higher risk of unmet IADL care needs. In contrast, among Taiwanese older adults, those who were not seeing their children once per day or per week and had a lower level of health were in the higher-risk group.

<Table 4>

3.3. Correlation between unmet care needs and mental well-being

Table 5 shows that unmet IADL care needs significantly correlated with depression and life satisfaction among older Chinese and Taiwanese adults. Older adults reporting unmet IADL needs had a higher CES-D score and a lower level of life satisfaction. However, the correlations between unmet ADL care needs and both depression and life satisfaction were not statistically significant in these two groups. This suggests that unmet IADL care needs, unlike unmet ADL care needs, are associated with poorer mental well-being in China and Taiwan.

< Table 5 >

4. Discussion

This study compared the care poverty rates and patterns of unmet care needs in older adults in China and Taiwan and investigated the association between unmet care needs and mental well-being. Except for living arrangements, these two groups of people showed markedly different

demographic and socioeconomic characteristics. Taiwan has a highly industrialized economy, whereas China is still in the process of rapid industrialisation, with the agriculture sector taking a large share of the economy. Such a difference in economic structure is consistent with the proportions of older adults living in urban areas shown in the two national surveys: 85% in Taiwan and 40% in China. China and Taiwan both belong to the East Asian and familism welfare regimes. This study showed that the majority of Chinese (89.2%) and Taiwanese (89.9%) older adults lived with someone who was mostly their spouse and children. However, older Chinese people see their children more frequently than their Taiwanese counterparts.

Kröger *et al*.'s study (2019) reported that ADL care poverty among older adults aged 75+ in Finland was 17%. We further analyzed the data, focusing on older adults of the same age (aged 75+) and found that both Chinese (30%) and Taiwanese (30%) older adults' ADL care poverty rates were 13% higher than their Finnish counterparts. This implies that older adults from these two East Asian welfare states were less likely than older adults from Finland, named as a Nordic welfare state, to have their care ADL needs met. Older Chinese adults showed a higher rate of IADL care poverty than their Taiwanese counterparts. One possible reason is that older Taiwanese adults have access to help with domestic tasks provided by live-in migrant care workers (Chou *et al*., 2015), which is not available to older adults in China (Wang & Chen, 2017).

This study showed that the predisposing, need, and enabling factors associated with unmet care needs were different in China and Taiwan. For example, older Chinese adults living in rural

areas were more likely to report unmet ADL and IADL care needs. China is undergoing rapid industrialisation and urbanisation, which have seen a massive number of working-age adults migrating from rural to urban areas and a rise in unmet needs in rural China. Our findings are consistent with Lu *et al.*'s (2015) work, which reported that older adults in urban China received more hours of care than those in rural China. In comparison, the likelihood of unmet care needs in Taiwanese older adults did not differ significantly according to residential areas. This suggests that the geographical distribution of LTC resources for older adults in China and Taiwan are different. Interestingly, older adults living in urban areas in Europe also face a lower risk of unmet care needs, but this is mainly because formal care services are more available in city centres than in remotely rural or sparsely populated areas (Manthorpe *et al*., 2008; Kröger *et al*., 2019).

We have also found similarities in the personal characteristics associated with unmet needs. Male older adults were less likely to have unmet ADL care needs in China and Taiwan, even though the results in the Taiwanese analyses were not statistically significant. Gender plays an important role in the traditional division of labor. In older couples, a wife is more likely to provide care to a husband rather than the other way round. Brown et al. (2008) reported that husbands were comfortable with letting other family members to provide care to wives while wives felt responsible for providing care to husbands. Put differently, older females are less likely than older males to receive spouse care, which can put them at a higher risk of unmet needs.

Older Chinese adults living alone were more likely to have unmet IADL care needs. Taiwanese older adults who lived alone were more likely to have unmet ADL and IADL care needs, similar to previous Taiwanese studies (Chen, 2009; Liu *et al*., 2012). Different from older adults in Western society, as discussed above, the majority of older Chinese and Taiwanese adults prefer living with children to living alone. Older Taiwanese adults living alone was related to a lack of informal social support and feeling lonely (Yeh & Lo, 2004), particularly for those living alone whose quality of life was worse than that of their counterparts dwelling in the community who did not live alone (Lin *et al*., 2008). The results further showed that Taiwanese older adults who contacted children less frequently lacked IADL care, which underscores the important role of children in ensuring care adequacy. Overall, support from family networks is vital to the reduction of care poverty in both China and Taiwan. The disadvantaged older adults facing a higher risk of unmet care needs were those who were single, had no close relationship with children, were living alone, or were living in rural areas.

A pension has a protective effect against unmet needs in both China and Taiwan. Both Chinese and Taiwanese adults who receive a pension are less likely to have unmet IADL care needs. The receipt of pension is correlated with income and indicates older adults' financial capability to purchase care or hire care workers. These results suggest that the LTC system in China and Taiwan needs to be re-evaluated. They raise questions about whether the care networks are sufficient for those with lower financial means in considering whether older adults can meet their

care needs by not counting on the private market, e.g., hiring a migrant care worker or buying private services in Taiwan. Care services from the private market in China are small but are expanding rapidly. However, without adequate financial support from the government, it seems likely that paid care services will be increasingly distributed in favor of the rich.

The analysis results in relation to the association between unmet care needs and mental well-being were highly similar between China and Taiwan. We found that unmet IADL care needs were strongly associated with both depressive symptoms and life dissatisfaction. However, there is no evidence in China or Taiwan to suggest that unmet ADL care needs and depressive symptoms are strongly correlated. The life restriction theory posits that older adults with ADL or IADL disability face great restrictions in their daily activities, which is the leading reason for poor mental well-being (Williamson, 2002). Our results show that people's depressive symptoms are less severe if their IADL care needs are fully met, which seems to suggest that adequate informal and formal care can protect older people from the negative impacts of IADL disability on mental well-being. However, depressive symptoms were largely non-responsive to whether ADL care needs were fully met or not. One explanation is that the life restriction impacts of ADL disability are exceedingly strong so that provision of care alone cannot reverse its impacts on mental well-being.

Although the two national surveys have comparable designs and the data were all based on 2015, limitations should be acknowledged for the comparison between China and Taiwan in this study. First, although we only used the same items of I/ADLs in the Chinese and Taiwanese

analyses, the wording of the questions between CHARLS and TLSA is slightly different. Second, family income data were not included as the independent variable of the analyses, as more than half of the observations had missing values in CHARLS and TLSA. This limitation is mitigated by the fact that we have investigated in our analyses other socioeconomic variables (income and educational achievement) which are highly correlated with income. As noted above, research findings in relation to those variables provide useful insight into the pattern of unmet needs in older people with varied socioeconomic status. Third, TLSA did not ask the participants whether they received care from a live-in migrant care worker. The family income and support from migrant care workers related to unmet care needs among Chinese and Taiwanese older adults could be compared in future studies. Additionally, this study was based on cross-sectional data and thus was unable to reveal causal relationships. There is a possibility that people with depressive symptoms are unwilling to seek help, which leads to unmet needs. A longitudinal and comparative study is desirable in the future.

5. Conclusions and Implications

China and Taiwan are East Asian welfare regimes that share the same family care values, but the LTC systems in China and Taiwan are at different stages of development. China and Taiwan differ significantly in terms of demographic and socioeconomic characteristics of the older population and the risk factors for unmet needs. Despite these differences, our findings largely echo

previous studies that caring for older adults remains a family responsibility in East Asia (Chou *et al*., 2015; Abrahamson, 2017). Our study underscores the importance of state support for older adults with care needs. In particular, the Chinese and Taiwanese governments should place greater emphasis on supporting people with severe functional disabilities, especially those who are single, living in rural areas, living alone, seeing children less frequently, and having no pension. Given that unmet IADL care needs are strongly associated with older adults' mental well-being (e.g., depression and life satisfaction), stepping up support to those with IADL care needs should have a positive impact on older adults' overall well-being.

Although LTC schemes have been launched and state care provision has been extended in China and Taiwan since the 1990s, all in all, this study found that both Chinese and Taiwanese older adults continue to rely heavily on family support to meet their care needs. Furthermore, a rapid increase in care needs and decrease in multi-generational households, coupled with low fertility rates and rising labor market participation in women, can be observed in both societies. In order to reduce care poverty and unmet needs, it is important to strengthen state support for older adults with care needs as well as their caregivers. Allocating more resources to the LTC care sector certainly plays a fundamental role, but beyond that, it also requires welfare states in East Asia to rethink their overarching roles in welfare provision and strike a balance between economic growth and social well-being. Our comparative analyses have reported useful information about the similarities and differences in care poverty and unmet needs in China and Taiwan. Future research

could benefit from expanding the comparative analyses to other countries belonging to the East Asian model such as Japan and Korea.

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Table 1. Characteristics of participants and comparison between China and Taiwan

	China	Taiwan	F/χ^2 test
	N=6,341	N=4,588	
	n (%)		
Age			338.36***
65-74	4332(68.7)	2356 (51.4)	
75+	1971(31.3)	2232 (48.7)	
Gender			4.65*
Male	3158 (49.9)	2192 (47.9)	
Female	3175 (50.1)	2396 (52.2)	
Marital status (w/wo spouse/partner)			217.40***
With spouse/partner	4558 (72.1)	2686 (58.5)	
Single	1768 (28.0)	1902 (41.5)	
Living area			2268.60***
Urban	2512 (39.6)	3903 (85.1)	
Rural	3829 (60.4)	685 (14.9)	
Education			225.33***
Primary and below	5195 (82.2)	3198 (69.9)	
Junior/senior and above	1128 (17.8)	1377 (30.1)	
Pension			455.23***
Yes	4758 (76.2)	1311 (52.9)	
No	1487 (23.8)	1168 (47.1)	
Living arrangement			1.35
Alone	685 (10.8)	464 (10.1)	
Not Living alone (with spouse/children/others)	5656(89.2)	4124 (89.9)	
Frequency seeing children			121.08***
Per day or living together	5021(79.2)	3223(70.3)	
Per week	727(11.5)	686(15.0)	
Longer than a week	593(9.4)	679(14.8)	
Self-reported health			301.62***
Very good	507 (8.8)	381 (8.3)	
Good	680 (11.8)	1082 (23.6)	
Fair	2944 (51.2)	1771 (38.6)	
Bad	1279 (22.3)	1034 (22.5)	
Very Bad	337 (5.9)	320 (7.0)	
Care needs in ADL			34.88***
Yes	830 (13.1)	787 (17.1)	
No	5511 (86.9)	3801 (82.9)	
Care needs in IADL			299.78***
Yes	1615(25.5)	1887 (41.1)	
No	4726(74.5)	2701 (58.9)	

Significance levels: $^{*}p< 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 2

Care poverty rate, care needs met and unmet of ADL and IADL among older adults in China and Taiwan

	No care need %		Met: Care need %		Unmet: care need %		Care poverty rate[a]		X^2
	China	Taiwan	China	Taiwan	China	Taiwan	China	Taiwan	
ADL	86.8	91.1	8.7	6.1	4.5	2.8	34.3	31.5	2.79
IADL	74.4	66.4	18.7	29.1	7.0	4.5	27.1	13.5	87.96***

Note: China N=6,341, ADL missing = 233, IADL missing = 388; Taiwan N= 4,588, ADL missing=416, IADL missing=519.

[a] Share of those with unmet needs out of all with care needs (Kroger *et al*., 2019).

Significance levels: $^{*}p< 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 3

Logistic regression analysis on unmet care needs in ADL

Independent Variable	China (n=597)		Taiwan(N=371)	
Predisposing factors	OR	95%CI	OR	95%CI
Age[a]	0.98	0.956 - 1.005	0.98	0.943-1.012
Sex (ref=female) (1=male)	0.66*	0.466 - 0.925	0.61	0.351-1.048
Marital status(ref=married) (1=single/widow/divorced)	1.30	0.858 - 1.967	0.73	0.424-1.254
Enabling factors				
Residential areas (ref=urban) (1=rural)	1.48*	1.060 - 2.079	0.67	0.344-1.298
Living arrangement (ref =with others) (1=alone)	0.96	0.537 - 1.725	6.87***	2.472-19.105
Frequency of seeing children (ref=longer than a week)				
1=per day	0.61	0.338 - 1.097	0.86	0.413-1.796
2=per week	0.60	0.280 - 1.293	0.87	0.338-2.235
Education (ref= Primary and below)				
1= Junior/senior/Bachelor and beyond	1.00	0.599 - 1.659	1.10	0.579-2.102
Pension (ref=yes) (1=no)	1.08	0.752 - 1.555	1.92	0.955-3.829
Need factors				
Level of ADL [b]	0.97	0.845 - 1.120	0.90*	0.832-0.977
Level of IADL [b]	0.73***	0.653 - 0.825	0.96	0.890-1.029
Self-rated health[a]	0.77**	0.640 - 0.930	0.95	0.720-1.258
Chi-square	103.19***		58.52***	

Note: Ref.: reference group.

[a] A higher score indicates older age, and better in health. [b] A higher (I)ADL score indicates greater (I)ADL limitations (i.e., lower functional capability).

China, missing = 233 ; Taiwan missing = 416.

Significance levels: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 4

Logistic regression analysis on unmet care needs in IADL

Independent Variable	China (N=1227)		Taiwan (N=1367)	
Predisposing factors	OR	95%CI	OR	95%CI
Age[a]	0.98*	0.961 - 0.997	0.96**	0.938-0.984
Sex (ref=female) (1=male)	1.15	0.895 - 1.473	0.81	0.552-1.199
Marital status(ref=married) (1=single/widow/divorced)	1.65***	1.233 - 2.208	1.28	0.861-1.910
Enabling factors				
Residential areas (ref=urban) (1=rural)	1.36*	1.055 - 1.754	0.69	0.420-1.116
Living arrangement (ref =with others) (1=alone)	1.81**	1.223 - 2.673	2.74***	1.673-4.497
Frequency of seeing children (ref=longer than a week)				
1=per day	0.73	0.476 - 1.112	0.28***	0.184-0.440
2=per week	1.00	0.580 - 1.726	0.49*	0.287-0.849
Education (ref=Primary and below)				
1= Junior/senior/Bachelor and beyond	0.68	0.436 - 1.054	1.04	0.685-1.576
Pension (ref=yes) (1=no)	1.35*	1.039 - 1.755	1.71*	1.077-2.711
Need factors				
Level of ADL [b]	0.85**	0.766 - 0.947	1.08	0.998-1.157
Level of IADL [b]	1.02	0.906 - 1.137	0.98	0.915-1.045
Self-rated health[a]	1.00	0.870 - 1.150	0.79*	0.646-0.954
Chi-square	78.39***		119.33***	

Note: Ref.: reference group.

[a] Continuous variables. A higher score indicates older age, and better in health. [b] A higher (I)ADL score indicates a higher level of (I)ADL limitations (i.e., lower functional capability).

China, missing = 388; Taiwan missing = 519.

Significance levels: $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Table 5

Pearson's Correlation Coefficients between unmet care needs in ADL, IADL, and depression and life satisfaction in China and Taiwan

China				
	1.	2.	3.	4.
1.Depression				
2.Life satisfaction	-0.252***			
3. Unmet ADL care needs (n=597)	-0.022	-0.075		
4. Unmet IADL care needs (n=1,227)	0.073*	-0.080**	0.256***	
Taiwan				
	1.	2.	3.	4.
1.Depression				
2.Life satisfaction	-0.386***			
3.Unmet ADL care needs (n=348)	0.106	-0.106		
4.Unmet IADL care needs (n=1417)	0.213***	-0.137*	0.433***	

Note: In both the Chinese and Taiwanese analyses, control variables include age, sex, marital status, level of education, residential area, living arrangement, frequency of seeing children, pension and self- reported health

Significance levels: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.