The effect of China's Integrated Medical and Social Care Policy on functional dependency and care deficits in older adults: a nationwide quasi-experimental study

Wenjian Zhou, Muqi Guo, Bo Hu, Yuling Jiang, Yao Yao

Summary

Background With population ageing, the development and implementation of pragmatic care strategies for older people with functional dependencies have become critical issues. In alliance with WHO's Integrated Care for Older People framework, China implemented the Integrated Medical and Social Care Policy (IMSCP) in several cities in 2016. This study aims to evaluate whether and to what extent the IMSCP has achieved its primary objectives of reducing functional dependency and addressing care needs in Chinese older adults aged 65 years and older.

Methods The IMSCP was initiated in 2016 in several pilot cities from various provinces. We did a quasi-experimental study with a difference-in-differences analysis by using the data collected in the 2014 and 2018 waves of the Chinese Longitudinal Healthy Longevity Survey. Participants from pilot cities constituted the intervention group, whereas participants from non-pilot cities were assigned into the control group. Functional dependency was measured based on activities of daily living and instrumental activities of daily living. Care deficits were recorded for those who were functionally dependent, and for whom care needs were unmet. We used fixed-effects models to examine between-group differences in functional dependency and care deficits.

Findings 3080 individuals who participated in both the 2014 and 2018 surveys were included (mean age 81·7 years [SD 9·1] in 2014; 1621 [52·6%] were female and 1459 [47·4%] were male). Of these, 1146 (37·2%) were in the intervention group and 1934 (62·8%) were in the control group. Implementing the IMSCP was associated with a reduced risk of functional dependency (odds ratio [OR] 0·72 [95% CI 0·58–0·89], p=0·0024). Among those who were functionally dependent, the IMSCP was also associated with less care deficits (0·62 [0·41–0·95], p=0·029). We also examined the relatively long-term impact of the IMSCP with duration from 2014 to 2021; the influence of the IMSCP on mitigating functional dependency remained in male participants (OR 0·45 [95% CI 0·23–0·87], p=0·017) but not in female participants (0·85 [0·52–1·39], p=0·524); while its association with bridging care deficits remained among the total participants.

Interpretation Implementing integrated medical and social care policy could reduce the risk of both functional dependency in older adults and care deficits in those who need care. These findings support the continued and expanded implementation of the IMSCP to address the growing care needs of China's ageing population.

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For the Chinese translation of the abstract see Online for appendix 1

School of Public Health, Peking University Health Science Center, Beijing, China (W Zhou PhD, Y Jiang MSc, Y Yao MD); **Center for Healthy Aging Transdisciplinary Sciences, China Center for Health Development Studies, Peking University, Beijing, China** (W Zhou, Y Jiang, Y Yao); **State Key Laboratory of Vascular Homeostasis and Remodelling, Peking University, Beijing, China** (Y Yao); **Harvard T H Chan School of Public Health, Boston, MA, USA** (M Guo PhD); **Care Policy and Evaluation Centre, London School of Economics and Political Science, London, UK** (B Hu PhD)

Correspondence to: Dr Yao Yao, Center for Healthy Aging Transdisciplinary Sciences, China Center for Health Development Studies, Peking University, Beijing 100191, China **yao.yao@bjmu.edu.cn**

Introduction

China is undergoing rapid population ageing, with the number of people aged 65 years and older projected to reach 390 million by 2050, representing a 79·7% increase from 2023.[1,2] This demographic shift is accompanied by a rise in functional dependency among older adults—defined as the inability to perform activities of daily living and instrumental activities of daily living.[3,4] This trend imposes a substantial burden on health-care and social care systems. Our previous study estimated that by 2030, there will be 14·02 million more older Chinese individuals requiring care compared with 2020.[5] Unmet care needs are prevalent among those with dependence, and China's traditional family-based care model is becoming unsustainable due to declining family sizes.[6] Addressing the escalating care needs of this expanding population poses a substantial challenge for China and other upper-middle-income nations. Consequently, with an increasing reliance on informal caregivers,[7] the development and implementation of pragmatic care strategies for older adults have become imperative.

To address this challenge, the Chinese Government has implemented the Integrated Medical and Social Care Policy (IMSCP), also known as yi-yang-jie-he (医养结合). The IMSCP is designed to consolidate fragmented health-care and social care services, thereby optimising support for older adults (especially the oldest-old [ie, those aged >79 years], seriously ill, or dependent) within primary care settings. Its goals include enhancing early prevention of

Research in context

Evidence before this study

We searched PubMed, Web of Science, and Google Scholar for studies published in English using the keywords: "integrat* medical and social care", "integrat* health and social care", "combin* medical and social care", "combin* health and social care", "service", "support", "dependency", "care need", "care deficit", and "unmet need" from database inception to July 20, 2024. Previous studies on the care needs of older people aged 65 years or older with functional dependency have primarily focused on the individual, family, or community level and have been done in high-income countries. Initiated in 2016, China's Integrated Medical and Social Care Policy (IMSCP) can be seen as the Chinese preliminary model of Integrated Care for Older People, proposed by WHO. Integrated Care for Older People is an important tool for achieving healthy ageing by integrating care services and working with the long-term care system to enhance the quality of life and health of older people as a response to population ageing and the increase in long-term care needs. Existing research on the IMSCP has predominantly been observational studies that are subject to confounding factors and limited to the examination of its short-term effects; few delve into the long-term effect of the IMSCP. Also, previous studies have not considered the unmet needs of older adults who are functionally dependent. To fill these research gaps and gain deeper insights, we used the 2014, 2018, and 2021 waves of the Chinese Longitudinal Healthy Longevity Survey and a quasi-experimental design to examine the short-term and long-term effects of the IMSCP on functional dependency and care deficits among Chinese older adults.

Added value of this study

This quasi-experimental study used a nationwide sample from 23 provinces across China to assess the effect of the IMSCP on both functional dependency in older adults (aged ≥65 years) and care deficits among those requiring care, using a difference-in-differences analysis. To the best of our knowledge, this is one of the first studies to apply a quasi-experimental design to investigate the beneficial effects of China's IMSCP on functional dependency and care deficits in older adults, from both short-term and long-term perspectives. These findings have substantial policy implications for dependency prevention and intervention.

Implications of all the available evidence

The evidence from this research suggests that the IMSCP could play a positive role in reducing both the risk of functional dependency in older adults and the care deficits in those who need care. However, inequity and scalability of the IMSCP needs further optimisation. Our findings support the urgent need to provide more accessible, sustainable, and equitable integration services of health and social care, given the rising number of older adults with functional dependency and care deficits among older adults in China.

major chronic conditions, maximising access to medical services, and increasing the capacity for long-term social care. This locally adapted initiative integrates previously isolated health-care and social care services, providing more convenient, accessible, and continuous integrated care (figure 1). During implementation, health insurance coverage was expanded, and long-term care insurance was developed to cover eligible care costs.[3,8] The IMSCP prioritises the health and social care needs of older adults and aligns with WHO's Integrated Care for Older People framework and the UN's Decade of Healthy Ageing,[1,9] both of which focus on older adult-centred integrated care. These initiatives aim to promote healthy ageing by maximising each person's intrinsic capacity and functional ability, emphasising the importance of reorienting coordinated care to improve health outcomes and quality of life for older individuals.[10] Integrated care is an emerging global trend to address population ageing. Previous studies examining the effects of integrated service policies have predominantly been done in high-income countries,[11–13] with only a few in China and other lower-middle-income nations, which are home to 70% of the world's older population.[14] Furthermore, studies on China's IMSCP have mainly been cross-sectional in design with limited sample sizes, providing some insights but lacking robust evidence on its impact on functional dependency and care deficits. This study aims to bridge the research gaps by investigating whether, and to what extent, the IMSCP achieves its developmental objectives.

See Online for appendix 2

Methods

Study design and participants

In 2016, the Chinese Government selected 90 cities in two successive batches as the pilot unities of the IMSCP, and encouraged localities to actively explore effective and practical local models of integration (appendix 2 p 3).[15,16] The IMSCP's primary aim is to facilitate the access of medical and health resources into aged-care institutions, communities, and households, and to support qualified aged-care institutions in establishing medical facilities. Participants residing in pilot cities of China for the IMSCP were assigned to the intervention group; participants from regions that contributed to the Chinese Longitudinal Healthy Longevity Survey (CLHLS) but that did not implement the IMSCP were considered as controls (figure 2 and appendix 2 p 9).

We used data collected during the 2014, 2018, and 2021 waves of the CLHLS, which is an ongoing prospective cohort study on the determinants of healthy ageing and longevity in older adults in China. The CLHLS is a nationwide survey on a randomly selected sample from half of the counties and cities in 23 of the 31 provinces of China, covering about 85% of the total population. The

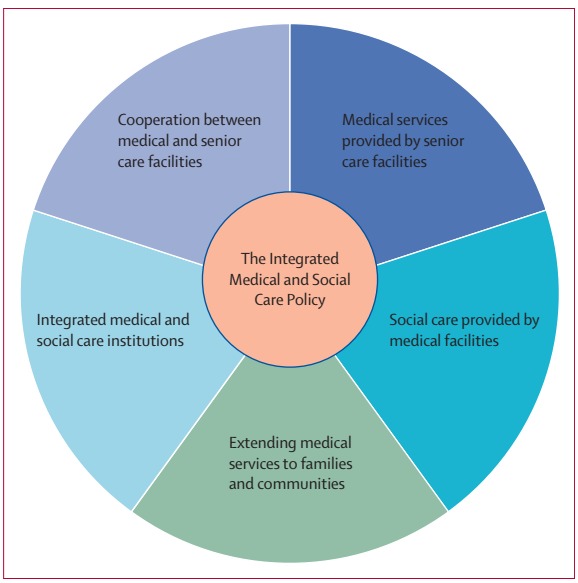

Figure 1: **Main integration approaches of the Integrated Medical and Social Care Policy**

questionnaire includes sociodemographic characteristics, psychological status, and physical capacity. More details on the sampling procedure and assessment of data quality can be found in a previous publication.[17] The CLHLS was approved by the Biomedical Ethics Committee, Peking University, Beijing, China (IRB00001052–13074). All participants provided written informed consent before participation.

Procedures and outcomes

Functional dependency was measured based on the interval of need, developed by Isaacs and Neville,[18] and widely applied in studies from the UK, the USA, and China.[4,19] This method categorises individuals on the basis of activities of daily living and instrumental activities of daily living according to the frequency with which they need care: high dependency (needs 24 h care), medium dependency (needs help at regular times daily), low dependency (needs help less than daily), or independence (free from care). In our study, we combined low, medium, and high dependency into a single and unified category. This combination helped distinguish between participants who needed care (the combined group) and those who did not. Activities of daily living include dressing and putting on shoes, bathing, feeding, transferring from chair or bed, using the toilet, and maintaining continence. Instrumental activities of daily living include washing clothes, cooking, shopping, and lifting 5 kg of weight. Further detail on the calculation of the interval need variable is available in appendix 2 (p 10).

Care deficits were also collected for those who were functionally dependent, and their care needs not met, through a combination of objective care deficits and subjective care deficits. Objective care deficits were assessed according to the question "who is the primary caregiver when you need assistance?", and participants who chose the option of nobody were considered to have objective unmet needs for assistance. Subjective care deficits were evaluated according to the question, "do you think the help that you received could meet your needs?", and respondents who selected "partly met or unmet" were considered to have subjective care deficits.[20] We considered a participant to have a care deficit when they exhibit the objective care deficit or subjective care deficit.[21] Further detail on the measurement of care deficits is available in appendix 2 (p 11).

Statistical analysis and covariates

The difference-in-differences model estimates the net effect of the intervention event by comparing the difference in change between the treatment and control groups before and after the intervention and is appropriate with assumption of common trends: it allows differences between treatment and control groups before the intervention and assumes the differences are parallel over time in the absence of the intervention.[22,23] We used difference-in-differences models to investigate the associations between China's IMSCP, and functional dependency in older adults and care deficits in those who need care.

$$\ln\left(\frac{P_{ict}}{1-P_{ict}}\right) = \alpha + \beta Treat_{ic} \times Post_{it} + \gamma Treat_{ic} + \delta Post_{it} + \sum_{j} \sigma_j Z_{ijt} + \rho_p + \tau_y$$

i denotes participant index; c denotes city index; p denotes province index; t denotes index of the CLHLS survey and is equal to 0 (the 2014 wave) or 1 (the 2018 wave); y denotes survey year index (including 2014, 2017, 2018, and 2019); P_{ict} denotes whether the participant has functional dependency or care deficit and is equal to 0 (no) or 1 (yes); $Treat_{ic}$ denotes the intervention group dummy variable and is equal to 0 (pilot cities for the IMSCP) or 1 (non-pilot cities); $Post_{it}$ denotes intervention time dummy variable and is equal to 0 (before 2016) or 1 (2016 or later); Z_{ijt} denotes the selected controlled covariates (ie, age, sex, education, marital status, number of chronic diseases, having old-age insurance, having medical insurance, living arrangement, and area of residence); α denotes the intercept; β denotes the association of the pilot policy with outcome in this study; γ is the coefficient for the intervention group dummy variable; δ is the coefficient for the intervention time dummy variable; σ_j is the coefficient for a specific covariate; ρ_p denotes the province-specific fixed effect; and τ_y denotes the year-specific fixed effect as the CLHLS 2018 wave collected data in 2017, 2018, and 2019. We compared the proportions of the older adults with functional dependency or care deficits across the intervention and control groups in the 2011–14 follow-up sample to verify whether between-group

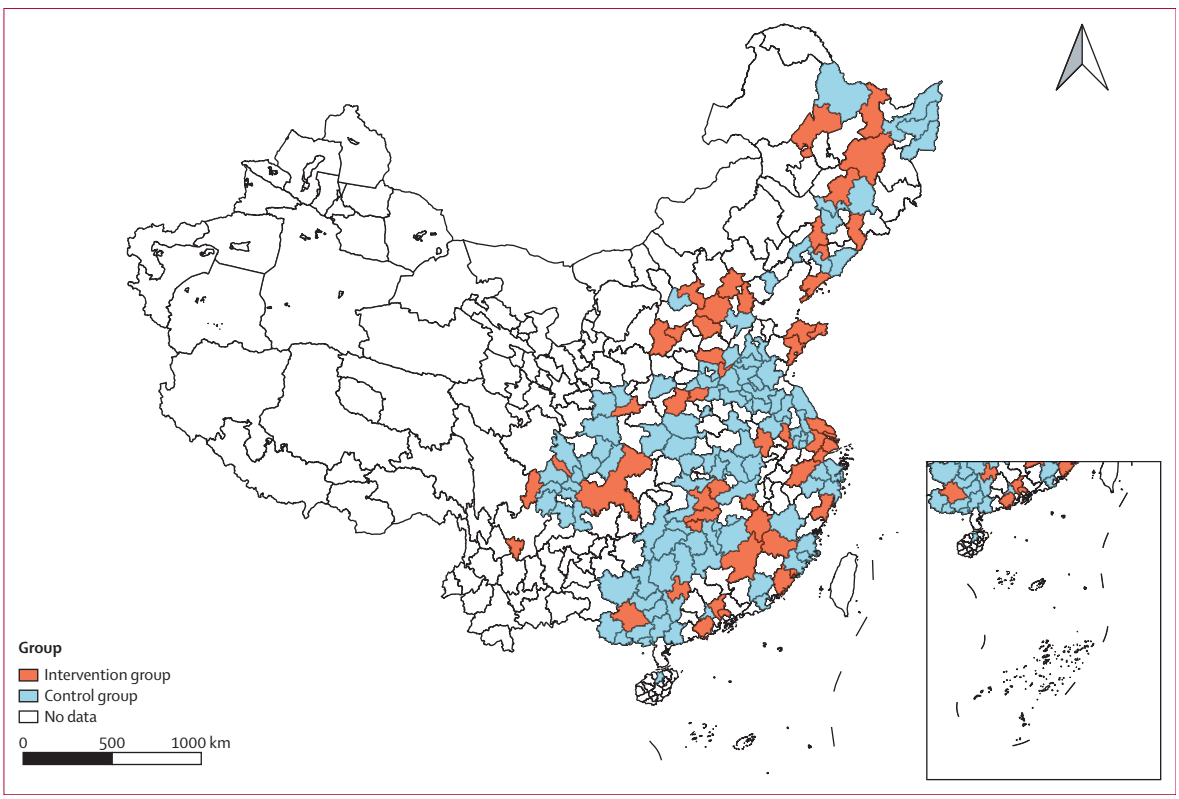

Figure 2: **Map of the cities where the intervention and control group areas are located in this study**

differences are parallel before 2016 (appendix 2 p 28). We also conducted the difference-in-differences analysis separately in different subpopulations, including age, sex, marital status, area of residence, and multimorbidity status. Meanwhile, we tested the statistical significance of moderating effects of these subgroup variables based on equation 2 (appendix 2 p 4).

In sensitivity analyses, we conducted the placebo test, which tests the authenticity of the original association by 500 iterations of randomly generated intervention assignments; if the association disappears in the hypothetical scenario, other random factors can be excluded from interfering with the results, thus verifying the reliability of the association in the real world.[22] We also used the synthetic difference-in-differences method, which ensured the synthetic control group had similar characteristics and maintained a parallel trend with the intervention group.[23] In addition, we estimated the associations by propensity score matching in the difference-in-differences method, for which we used the 1:1 nearest neighbour matching method.[24] We performed both the balancing test and common support assumption to ensure the validity and comparability of our analysis. And we compared the distribution of propensity scores between the intervention and control groups after the matching process. The short-term (median 2 years) associations of the IMSCP were analysed based on the above equation. Furthermore, we analysed the long-term (5 years) associations between the IMSCP, and functional dependency and care deficits by the difference-in-differences method based on the equation, using samples both surveyed within the 2014 wave and 2021 wave of the CLHLS.

All statistical analyses were conducted using STATA (version 18). Missing covariates were interpolated using the multiple imputation by chained equations, and the number of iterations is 1.[4] We also replaced it with 5 in the sensitivity analysis (appendix 2 p 13). And we conducted the sensitivity analysis excluding participants with missing values (appendix 2 p 14).

Role of the funding source

The funders had no role in the study design, data collection, data analysis, data interpretation, or writing of the report.

Results

The short-term analysis included 3393 participants aged 65 years or older participating in both the 2014 and 2018 waves of the CLHLS (appendix 2 p 23). Among them, we further excluded 313 participants with missingness in outcomes of interest or residential address, which was necessary to identify whether participants were residing in the policy-implementation cities or not. The final analysis sample included 3080 participants, with 1146 in the policy-implementation cities and 1934 in control cities. Among them, the long-term analysis included 1125 participants participating in both the 2014 and 2021 waves.

	Total (n=3080)		Control group (n=1934)		Intervention group (n=1146)	
	2014	2018	2014	2018	2014	2018
Age, year	81·7 (9·1)	85·5 (9·0)	81·8 (9·1)	85·6 (9·1)	81·4 (8·9)	85·4 (8·9)
Education, year	2·7 (3·6)	2·9 (3·9)	2·5 (3·5)	2·9 (3·8)	2·9 (3·7)	3·0 (4·0)
Sex						
Male	1459 (47·4%)	1459 (47·4%)	903 (46·7%)	903 (46·7%)	556 (48·5%)	556 (48·5%)
Female	1621 (52·6%)	1621 (52·6%)	1031 (53·3%)	1031 (53·3%)	590 (51·5%)	590 (51·5%)
Marital status						
Married but not living with spouse, divorced, widowed, or never married	1599 (51·9%)	1837 (59·6%)	1053 (54·4%)	1199 (62·0%)	546 (47·6%)	638 (55·7%)
Married and living with spouse	1446 (46·9%)	1207 (39·2%)	865 (44·7%)	715 (37·0%)	581 (50·7%)	492 (42·9%)
Missing	35 (1·1%)	36 (1·2%)	16 (0·8%)	20 (1·0%)	19 (1·7%)	16 (1·4%)
Number of chronic diseases	1·2 (1·4)	1·3 (1·4)	1·1 (1·4)	1·2 (1·4)	1·3 (1·5)	1·3 (1·5)
Having old-age insurance						
No	1959 (63·6%)	1921 (62·4%)	1278 (66·1%)	1227 (63·4%)	681 (59·4%)	694 (60·6%)
Yes	1121 (36·4%)	1159 (37·6%)	656 (33·9%)	707 (36·6%)	465 (40·6 %)	452 (39·4%)
Having medical insurance						
No	250 (8·1%)	425 (13·8%)	155 (8·0%)	239 (12·4%)	95 (8·3%)	186 (16·2%)
Yes	2830 (91·9%)	2655 (86·2%)	1779 (92·0%)	1695 (87·6%)	1051 (91·7%)	960 (83·8%)
Living arrangement						
Living with other people	2352 (76·4%)	2358 (76·6%)	1486 (76·8%)	1495 (77·3%)	866 (75·6%)	863 (75·3%)
Living alone	666 (21·6%)	539 (17·5%)	396 (20·5%)	325 (16·8%)	270 (23·6%)	214 (18·7%)
Living in an institution	41 (1·3%)	66 (2·1%)	33 (1·7%)	40 (2·1%)	8 (0·7%)	26 (2·3%)
Missing	21 (0·7%)	117 (3·8%)	19 (1·0%)	74 (3·8%)	2 (0·2%)	43 (3·8%)
Area of residence						
City	371 (12·0%)	406 (13·2%)	188 (9·7%)	223 (11·5%)	183 (16·0%)	183 (16·0%)
Town	977 (31·7%)	1042 (33·8%)	609 (31·5%)	707 (36·6 %)	368 (32·1%)	335 (29·2%)
Rural	1732 (56·2%)	1632 (53·0%)	1137 (58·8%)	1004 (51·9%)	595 (51·9%)	628 (54·8%)

Data are n (%) or mean (SD).

Table 1: **Characteristics of the study participants**

The mean age of participants in 2014 was 81·7 years (SD 9·1), with 1621 (52·6%) female participants and 1459 (47·4%) male participants. Among these, 1146 (37·2%) were from pilot cities that implemented the IMSCP, constituting the intervention group, and 1934 (62·8%) were from non-pilot cities, forming the control group (table 1). Baseline characteristics between the two groups were comparable.

Between 2014 and 2018, the proportion of functionally dependent participants increased from 35·7% to 56·5% in the control group and from 39·6% to 55·4% in the intervention group. Similar trends were obtained using propensity score matching (appendix 2 p 24). The results weighted by baseline weights are presented in appendix 2 (p 25). Furthermore, we analysed the transition frequency and percentage between functional dependency and independence across the intervention and control groups from 2014 to 2018. In the intervention group, the percentage of individuals retaining functional dependency was 83·5% and the percentage of those changing from independence to dependence was 37·0%, lower than those in the control group (85·1% and 40·6%, respectively). However, the percentages of individuals changing from dependence to independence was 16·5% and the percentage of those retaining functional independence was 63·0% in the intervention group, higher than those in the control group (14·9% and 59·4%, respectively; appendix 2 p 26).

	Odds ratio (95% CI)	p value
Functional dependency		
Model 1	0·810 (0·693–0·947)	0·0084
Model 2	0·718 (0·580–0·889)	0·0024
Care deficits		
Model 3	0·624 (0·412–0·943)	0·025
Model 4	0·622 (0·406–0·953)	0·029

Model 1 and model 3 are unadjusted models. Model 2 and model 4 are adjusted for age, sex, education, marital status, number of chronic diseases, having old-age insurance, having medical insurance, living arrangement, and area of residence, based on model 1 and model 3, respectively. Standard errors are clustered at the individual level.

Table 2: **Estimated effects of the Integrated Medical and Social Care Policy on functional dependency and care deficits**

Our analysis of the difference-in-differences model found a significant reduction in the risk of functional dependency among older adults in the intervention group compared with the control group (table 2). In the fully adjusted model,

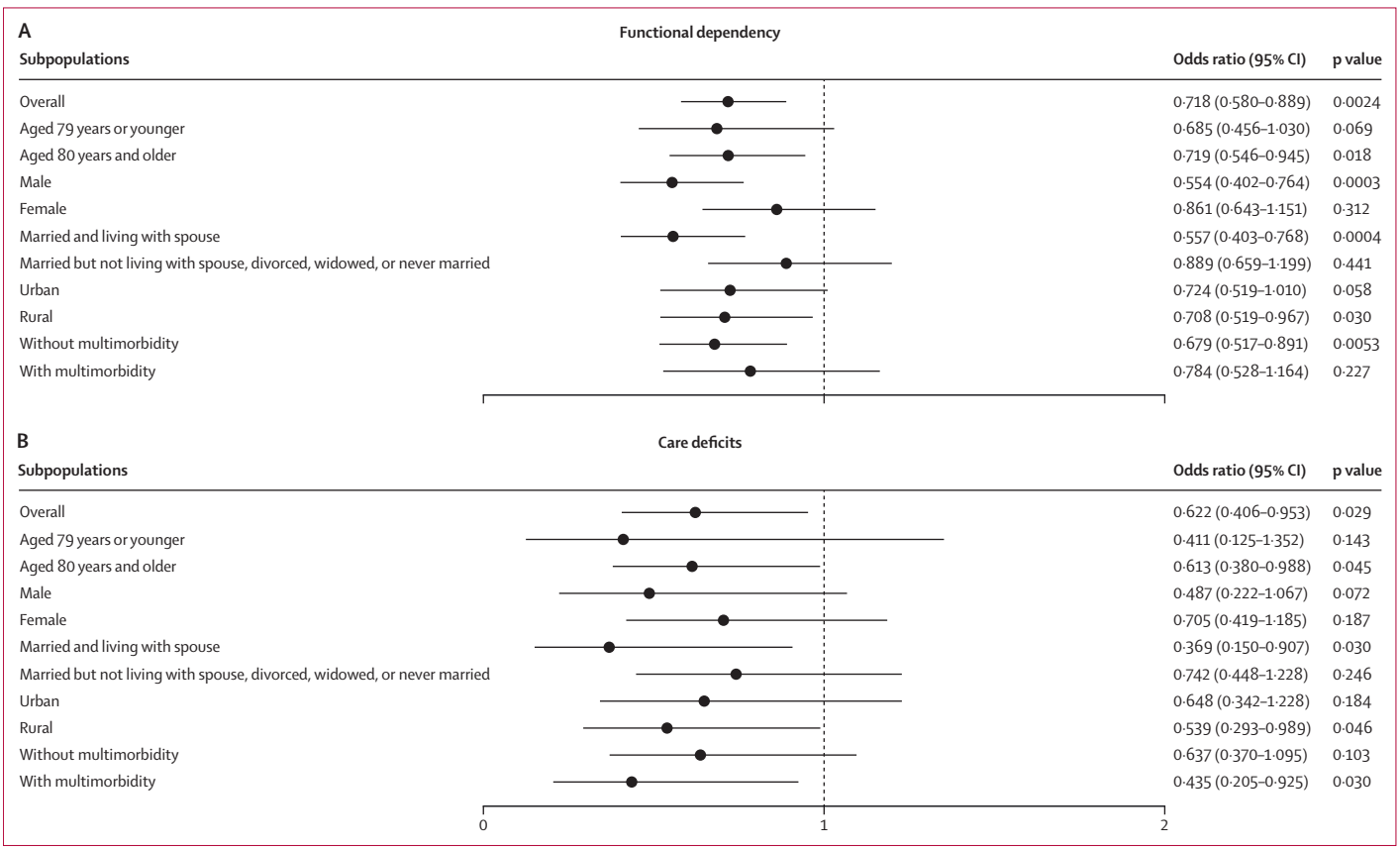

Figure 3: **Estimated associations of the Integrated Medical and Social Care Policy with functional dependency (A) and care deficits (B) in subpopulations**
Models were adjusted for age, sex, education, marital status, number of chronic diseases, having old-age insurance, having medical insurance, living arrangement, and area of residence. SEs are clustered at the individual level.

the odds ratio (OR) for functional dependency was 0·72 (95% CI 0·58–0·89; p=0·0024), indicating a 28% reduction in the likelihood of becoming functionally dependent in the intervention group.

Between 2014 and 2018, the proportion of participants with care deficits increased from 15·8% to 24·8% in the control group and from 20·9% to 22·5% in the intervention group (appendix 2 p 24). Similar trends were obtained using propensity score matching (appendix 2 p 24). Furthermore, we analysed the transition frequency and percentage between having care deficits and no care deficits across the intervention group and the control group from 2014 to 2018. In the intervention group, the percentages were 22·1% for individuals remaining having care deficits and 22·6% for those transitioning from no care deficits to having them, respectively, lower than those (26·6% and 24·4%) in the control group (appendix 2 p 26). However, the percentages were 77·9% for individuals transitioning from having care deficits to no care deficits and 77·4% for those remaining having no care deficits in the intervention group, respectively, higher than those (73·4% and 75·6%) in the control group (appendix 2 p 26).

Among those who were functionally dependent, the IMSCP was associated with a significant reduction in care deficits (table 2). The OR for care deficits was 0·62 (0·41–0·95; p=0·029), indicating a 38% reduction in the likelihood associated with care deficits.

In subgroup analyses of functional dependency (figure 3), we found that effect estimates were modified by age (OR 0·685 [95% CI 0·456–1·030] for participants aged ≤79 years and 0·719 [0·546–0·945] for participants aged ≥80 years), sex (0·554 [0·402–0·764] for male participants and 0·861 [0·643–1·151] for female participants), marital status (0·557 [0·403–0·768] for individuals who were married and living with a spouse and 0·889 [0·659–1·199] for those who were married but not living with a spouse, divorced, widowed, or never married), area of residence (0·724 [0·519–1·010] for participants living in urban areas [ie, a city or town] and 0·708 [0·519–0·967] for participants living in rural areas), and multimorbidity status (0·679 [0·517–0·891] for participants without multimorbidity and 0·784 [0·528–1·164] for participants with multimorbidity).

In subgroup analyses of care deficits (figure 3), we found that association estimates were modified by age (0·411 [0·125–1·352] for participants aged ≤79 years and 0·613 [0·380–0·988] for participants aged ≥80 years), sex (0·487 [0·222–1·067] for male participants and 0·705 [0·419–1·185] for female participants), marital status (0·369 [0·150–0·907] for individuals who were married and

living with a spouse and 0·742 [0·448–1·228] for those who were married but not living with a spouse, divorced, widowed, or never married), area of residence (0·648 [0·342–1·228] for participants living in urban areas and 0·539 [0·293–0·989] for participants living in rural areas), and multimorbidity status (0·637 [0·370–1·095] for participants without multimorbidity and 0·435 [0·205–0·925] for participants with multimorbidity).

In the sensitivity analysis for functional dependency, the placebo test underscores the robustness and credibility of the identified association (appendix 2 p 29). Even though we further incorporated three items related to older adults' outings in the measurement of functional dependency, the results are still robust, similar to the main results (appendix 2 p 12). The results of controlling more covariates or estimating by the synthetic difference-in-differences method can be seen in appendix 2 (pp 15–16). By propensity score matching in the difference-in-differences method, the OR was 0·717 (95% CI 0·579–0·888; appendix 2 p 17); both the balancing test (appendix 2 p 31) and common support test (appendix 2 p 32) were successfully passed; and the distribution of propensity scores was comparable between the intervention and control groups after the matching process (appendix 2 pp 33–34). The long-term (5 year) association of the IMSCP with functional dependency was analysed, (OR 0·700 [95% CI 0·480–1·020]; appendix 2 p 18); and the association estimates were modified by sex (0·450 [0·234–0·868] for male participants and 0·853 [0·524–1·389] for female participants; appendix 2 p 40). Compared with the short-term association, the long-term association of the IMSCP with functional dependency declined in statistical significance (appendix 2 p 39).

In the sensitivity analysis for care deficits, the placebo test also underscores the robustness and credibility of the identified association (appendix 2 p 30). After adjusting for the measurement of functional dependency, the results are similar to the main results (appendix 2 p 12). The results of controlling more covariates or estimating by synthetic difference-in-differences method can be seen in appendix 2 (pp 15–16). By propensity score matching in the difference-in-differences method, the OR was 0·642 [0·418–0·988] (appendix 2 p 17); both the balancing test (appendix 2 p 35) and common support test (appendix 2 p 36) have been successfully passed; and the distribution of propensity scores was comparable between the two groups after the matching process (appendix 2 pp 37–38). We also analysed the long-term association of the IMSCP with care deficits; the OR 0·299 (95% CI 0·119–0·746; appendix 2 p 18) and the subgroup analyses can be found in appendix 2 (p 40). Compared with the short-term association, the long-term association of the IMSCP with care deficits intensified (appendix 2 p 39).

Discussion

This nationwide quasi-experimental study shows that China's IMSCP was associated with significantly reduced functional dependency risk and care deficits among older adults, aligning with WHO's Integrated Care for Older People framework. Although the long-term association with functional dependency was diminished, possibly due to age-related decline, the policy appeared to sustain benefits for older males, underscoring gender disparities linked to socioeconomic inequalities and care accessibility gaps for females. The reduction of care deficits can be attributed to the increased availability and use of formal care services facilitated by the IMSCP, highlighting its role in addressing care deficits and improving the quality of care for older adults.

Our findings address a crucial evidence gap on the associations of integrated care with dependency and care deficits, complementing global models such as the Services for Integrated Care for Frail Elders in Canada,[11] the Program of All-inclusive Care for the Elderly in the USA,[12] and the Enhanced Health for Care Homes in the UK.[13] Previous studies have examined the effect of the Services for Integrated Care for Frail Elders model on the overall costs associated with health and social services, as well as the impact of the Program of All-inclusive Care for the Elderly on acute care admissions. Although these findings align with the objectives of the Integrated Care for Older People initiative, there is a scarcity of research investigating the effects of integrated care on dependency and care deficits. We filled the research gap by providing evidence of the association and possible impact of the IMSCP on reducing functional dependency and care deficits among Chinese older adults.

Our findings indicate that, in the short term, implementing the IMSCP was associated with a 28% reduction in the risk of functional dependency, predominantly in cases of low to medium dependency (appendix 2 p 27). This outcome highlights the potential of integrated care in promoting functional independence among older adults. However, the IMSCP's long-term impact on functional dependency showed a gradual decline, possibly attributable to age-related physiological decline. Notably, the policy was still associated with mitigation of functional dependency among older males, emphasising the need to optimise the design for older females. This gender disparity could be partly explained by differences in socioeconomic status, education, and social resources, with men typically having higher education levels and socioeconomic standing than women (appendix 2 p 42), thus facilitating greater access to integrated services.[25] Additionally, women often prioritise household responsibilities over their own health needs, further limiting their use of available services.[26]

Among those who were functionally dependent, the IMSCP was associated with a 38% reduction in care deficits in the short term, with the association intensifying over the long term. This suggests that the policy may significantly enhance the provision and use of formal care services, effectively addressing unmet care needs. The short-term association was more pronounced, although not statistically significant, among younger older adults (ie, those aged <80 years) compared with the oldest-old (≥80 years). This

could be due to the lower prevalence of dependency states among the younger group (appendix 2 p 41), resulting in their care needs being more readily met, and the relatively smaller sample size of younger individuals (400 [17·5%] *vs* 1888 [82·5%] in the oldest group) limiting statistical significance. Additionally, the long-term association was only significant among older females, likely reflecting their longer life expectancy and higher prevalence of widowhood, which increases their reliance on professional care services.

Despite slow progress in integration efforts within China, primarily due to regulatory barriers and few incentives for hospitals to provide integrated services,[3] the association of the IMSCP with reductions in functional dependency and care deficits carries major implications for health and social care policy. Notably, China's central document for 2025 has prioritised addressing population ageing, outlining the pivotal role for advancing the IMSCP to improve health, care, and quality of life for the older population.[27] The key messages of the 2025 central document include promoting the integration of medical and social care services by strengthening the synergy between health care and social care across policy frameworks, service systems, and operational processes, while simultaneously enhancing disease prevention and control measures.[8,27] Establishing efficient green channels (ie, dedicated channels for providing older individuals with prioritised and barrier-free integrated services) for bidirectional referrals and simplifying referral procedures are crucial steps. Furthermore, there is an urgent need to train specialists in geriatrics, nursing, rehabilitations, and formal care to foster effective collaboration, alongside improving their remuneration. Expanding health insurance coverage to include a wider range of integrated services, such as therapeutic rehabilitation aids and internet-based medical services, is also crucial.[28] Emphasising the early identification of populations at high risk for disabilities and implementing preventive measures, alongside providing health guidance and comprehensive interventions, aligns with the central document's directives and is imperative for the sustained success of the IMSCP.

For the **Center for Healthy Aging and Development Studies website** see https://opendata.pku.edu.cn/dataverse/CHADS

Accessibility to medical services is strongly correlated with the health status of older adults, while access to social care services is closely associated with care deficits. Adhering to the principles of ageing in place and integrated care, integrated health-care and social care facilities provide health management and long-term care services in the same locations, thereby reducing the time and costs associated with transfers between homes, medical facilities, and aged-care institutions.[25] This integration is invaluable in delivering a continuum of holistic health-care and social care services, substantially enhancing the use of health assessments, interventions, and management services among older adults. Notably, while immediate access to these services might lead to short-term improvements in functional dependency and care deficits, the full long-term effects of the IMSCP could require several years to manifest.

The strengths of this study include the large, nationally representative sample and the rigorous quasi-experimental design, thereby enhancing the validity and generalisability of our findings. Nevertheless, the study has limitations. The reliance on self-reported data for functional dependency and care deficits could introduce reporting bias. Additionally, unmeasured factors could still affect outcomes despite controlling for confounders.

Given the positive correlation of the IMSCP, further research is warranted to examine its long-term sustainability and potential for scaling up. Studies should explore how the IMSCP works, including the roles of specific care components and stakeholder engagement. Additionally, assessing its cost-effectiveness will provide valuable insights for resource allocation and policy making, facilitating informed strategies to meet the growing care needs of ageing populations in China and beyond.

This quasi-experimental study in China provides evidence of the benefits of integrated medical and social care in reducing functional dependency and care deficits among older adults. The findings support the optimisation and expansion of integrated care models to address the increasing care needs of ageing populations in China.

Contributors

YY and WZ designed and directed the research. WZ prepared and analysed the data. WZ drafted the manuscript. WZ, MG, BH, YJ, and YY revised the manuscript. YY and YJ verified the data and had full access to the residential data at city level and the 2021 wave of the CLHLS. All authors had access to the 2014 and 2018 waves of the CLHLS. YY had final responsibility for submission.

Declaration of interests

We declare no competing interests.

Data sharing

The data that support the findings of this study are publicly available from the Center for Healthy Aging and Development Studies, Peking University (Beijing, China). The residential data at the city level of each participant in the CLHLS were sensitive information and used under licence and authorisation, thus they are not publicly available. However, residential data at the city level are available from the authors upon reasonable request and with permission from the principal investigators of the CLHLS or the corresponding author.

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Editorial note: The Lancet Group takes a neutral position with respect to territorial claims in published maps.

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