

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Caregiver Burden and Its Associated Factors among Family Caregivers of Persons with Dementia in Shanghai, China: A Cross-Sectional Study
AUTHORS	Liu, Zhijian; wenjing, sun; Chen, Honglin; Zhuang, Jianhua; Wu, Bei; Xu, Hanzhang; Li, Peng; Chen, Xiaohan; Li, Juan; Yin, You

VERSION 1 – REVIEW

REVIEWER	Tan, Lay Ling Changi General Hospital, General Psychiatry
REVIEW RETURNED	23-Oct-2021

GENERAL COMMENTS	<p>Thank you for the opportunity to review your paper. It is an important paper which highlighted the caregiver distress and burden of PWD in one of the major cities in China to enhance community services and support. However the authors highlighted similar studies in northern cities in China (page 4) but stated that the level and related factors of caregiver burden of PWD were not consistent. Are the authors able to explain what this meant and how this current study was justified?</p> <p>Under the methodology section, page 5 “among these 2272 old adults, 500 old adults were selected randomly to receive Mini-Mental State Examination” . Can the authors explain the selection for 500 elderly? The authors also stated that “patients and the public were not involved in the study” . Were the authors referring to the fact that the patients and public were not involved in the data management and analysis? This was unclear. May I also enquire which diagnostic criteria did the authors use for the subtypes of dementia in this study?</p> <p>The following are elaborations of my 'No' responses above: For the abstract, I have difficulty understanding what are “cope strategy of PWD” (line 40) and “moderate effect was tested” (line 42). The conclusions can be improved and elaborated e.g. the “various factors” of caregiver burden .</p> <p>For the references, I noted that there are several errors messages with ‘reference source not found’.</p> <p>For the results, there may be an error in the percentage of females in PWD. Both caregivers and PWD were reported as 57.8% which differs from the data reported in Tables 2 & 3. There is also an error with the title for figure 2 and the x-axis detailing caregiver burden should be made clearer.</p> <p>In the discussion, the authors concluded that the caregiver burden was relatively high in the first para (page 8 line 46) but the elaboration that it was relatively high as compared to previous studies was mentioned only later in the second para. It may be clearer if the elaboration was made earlier. With reference to Page 9 “Firstly, present study has shown that worse cognitive function of</p>
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	<p>PWDs and older age of PWDs was related to more caregiver burden, which was consistent with previous studies”, were those previous studies done in western populations? Are the authors able to make comparisons with more similar cultural groups or the previous studies in China alluded to earlier in the paper? With reference to Page 9 line 11, “Secondly, The differences of caregiver burden from similar samples between previous studies and present study...”, are the authors referring to the relatively high caregiver burden? If so, it should be stated more clearly. The authors should also take note of grammatical errors and sentence structuring for this part of the discussion. Page 9 second last para “Previous studies also reported that the PAC was associated with the higher level of caregiver burden”. Is there an error in this statement? Should it be “Previous studies also reported that the PAC was associated with lower level of caregiver burden”? Page 9 last para “Utilization of community service may make caregivers experience more stigmatic feelings from their neighbors, friends or colleagues and further increase the level of caregiver burden” – how is this statement justified by the findings of this study? The standard of written English needs to be improved, particularly for the discussion section.</p>
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REVIEWER	Yeoh, EK Chinese University of Hong Kong
REVIEW RETURNED	05-Nov-2021

GENERAL COMMENTS	<p>OVERALL COMMENTS</p> <p>This article could have a potential to contribute to the field of literature with a cross-sectional survey done in the caregivers of PWD in Shanghai. The paper needs to be restructured to focus on the stated objective of the study - to explore the factors for caregiver burden. The key construct is the Caregiver Burden Inventory which has 5 domains. However except for the Time Domain, it is unclear which of the data is used to calculate the other 4 Domains and the constructs of the domains. The 3 questions on social support cannot be equated with social burden. In the methods only Self Rated Depression Scale is mentioned for assessing care givers 'Depression' No mention is made on how 'Emotional Burden' is calculated. Table 2 under Disease characteristics is an item 'NPI total symptom scale' which relates to the patient has an item 'Care giver distress subscale' which cannot be equated with 'Emotional Burden'.</p> <p>There are a number of related measurements such as 'Positive Aspects of caregiving' PAC but no data in the results other than an item 'Positive feeling of caregivers'.</p> <p>The analysis in the results section should clearly demonstrate which data is used to calculate each of the 5 domains of care giver burden.</p> <p>Reference should also be made to the validated instrument in the data required for each of the 5 domains.</p> <p>ABSTRACT</p> <ol style="list-style-type: none"> 1. Information mentioned in the Methods should match with that in the Results: MoCA was mentioned in Results only. 2. In Results, it was mentioned that “social support moderated the relationship between the caregiver burden and caregiver's depression” but the measurement for “depression” was not identified (CBI only measures “emotional burden”, which is not equal to clinical ‘depression’ (e.g. MDD); burden is only the ‘cost’ of caregiving but not necessarily a disorder).
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3. Same comments for 'depression' in Conclusion.

4. Reference should be given to interpret CBI scores.

STRENGTH AND LIMITATION

5. P.3 line 1: "The conclusion of our study may provide strategy of reducing the caregiver burden of PWDs' caregivers." There is limited information and analysis of factors for caregiver burden, inform strategy for reducing the burden.

6. P.3 line 3: The sampling frame is a plus to the generalizability of this study, that would need further support from a more detailed account on the sampling methods (e.g. convenient samplings from large dementia clinics (that service > 500 populations) in the regions?

INTRODUCTION

7. P.3 line 38: this is good to include the cost of dementia in China to illustrate the importance of caregivers as the major lay care provider to PWD. See Xu, J., Wang, J., Wimo, A., Fratiglioni, L., & Qiu, C. (2017). The economic burden of dementia in China, 1990-2030: implications for health policy. *Bulletin of the World Health Organization*, 95(1), 18–26.

<https://doi.org/10.2471/BLT.15.167726>.

8. p.4 line 1 Study was done in Hong Kong to explore risk factors contributing factors to cost of caregiving, and the protective effect of community care services. See Chan, C.Y., Cheung, G., Martinez-Ruiz, A. et al. Caregiving burnout of community-dwelling people with dementia in Hong Kong and New Zealand: a cross-sectional study. *BMC Geriatr* 21, 261 (2021).

<https://doi.org/10.1186/s12877-021-02153-6>.

9. P.4 line 7: Same as #2. Burden and depression (and anxiety) are usually tested separately in caregiver research, where the former one could be the emotional strain multifaceted with health, mental and social cost of caregiving, and in a factor for depression and anxiety. You might check Liu, Z., Heffernan, C., & Tan, J. (2020). Caregiver burden: A concept analysis. *International journal of nursing sciences*, 7(4), 438–445.

<https://doi.org/10.1016/j.ijnss.2020.07.012> and Sherwood, P. R., Given, C. W., Given, B. A., & von Eye, A. (2005). Caregiver Burden and Depressive Symptoms: Analysis of Common Outcomes in Caregivers of Elderly Patients. *Journal of Aging and Health*, 17(2), 125–147. <https://doi.org/10.1177/0898264304274179> for a more general understanding on caregiver burden.

10. P.4 line 21: In this paragraph, the authors illustrated the significance of dementia caregiver burden in China, through the lens of healthcare system and cultural difference. This is important to test and discuss the political & cultural determinants on the Chinese caregivers' evaluation on the caregiving burden, and how does it impact on the structure of risk factors contribute to the understandings of caregiving activities for PWD in this landscape. This has to be strengthened in both INTRODUCTION and DISCUSSION sections of this paper.

11. The hypothesis of this study is unclear.

PARTICIPANTS AND METHODS

12. The randomized nature of the sampling method could be a strong plus to the generalizability to the study and ought to be emphasized in both abstract and strengths of this study.

13. A flow chart could help to illustrate the sampling method.

14. The calculation of the power of the sample size to detect significance of the estimated differences of the variables in

	<p>predicting the outcome should be given. The basis of the estimated differences should also be given.</p> <p>15. P.5 line 25: Please specify that the Chinese version of CBI was used. Was the validity of CBI tested in mainland China/ Shanghai landscape? If yes, relevant citations should be included.</p> <p>16. page 5, line 50: please include description of measures on caregiver depression in the ABSTRACT</p> <p>page 5, line 50: caregivers' depression is more likely an outcome of caregiver burden.</p> <p>17. p.5 line 56: Please noted that utilisation of community services use is not equivalent to services needs as the authors have written in the ABSTRACT (p.2 line 40 "community services needs"). Needs is a capacity to benefit from better intervention/ treatment, that could be expressed, felt, normative. Please see Bradshaw's explanation on this. Bradshaw, Jonathan. (1972). A Taxonomy of Social Need. New Society. 30.</p> <p>18. For a more accurate understanding of parameter for services utilization & social support, please specify the timeframe for the use of services (e.g. in the past 7 days).</p> <p>19. P.7 line 33: Please specify the p value adopted for purposive selection of covariate in univariate regression. A different alpha should be set for purposive selection. See Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. Source code for biology and medicine, 3, 17. https://doi.org/10.1186/1751-0473-3-17.</p> <p>RESULTS (Please note that 'results' is usually plural)</p> <p>20. There were some grammatical and language errors. Please refer to the section "OTHERS".</p> <p>DISCUSSION</p> <p>21. P.8 line 46: "The level of caregiver burden was relatively high." Please discuss with reference to a comparable population (e.g. Chinese) / culture (e.g. Korean/ Japanese as two clans that inherit the tradition of Confucianism. See Chan S, W, -C: Family Caregiving in Dementia: The Asian Perspective of a Global Problem. Dement Geriatr Cogn Disord 2010;30:469-478. doi: 10.1159/000322086.</p> <p>OTHERS</p> <p>Minor typos/unclear phrases/ typesetting inconsistencies were identified:</p> <p>p.2 line 40: cope strategy(ies) (of)</p> <p>p.2 line 44: Result(s)</p> <p>p.2 line 48: double spacing after "Besides, "</p> <p>p.3 line 27, 38, 54, 60: reference source is missing</p> <p>p.7 line 56 "Among 109 PWDs, 83 (76.1%) with high school education or above, 12(11.0%) middle school, 7(6.4%) primary school, and 7(6.4%) illiteracy." There is no verb in this sentence.</p> <p>p.8 line 3 "dementia patients' please avoid stigmatizing language.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1			
Q1	However the authors highlighted similar studies in northern cities in	Our unique contributions are twofold: first, the	A cross-section study in Hong Kong revealed that the prevalence of

	<p>China (page 4) but stated that the level and related factors of caregiver burden of PWD were not consistent. Are the authors able to explain what this meant and how this current study was justified?</p>	<p>previous studies did not include some key factors, such as positive aspects of caregiving, social support, and community service utilization, that could impact caregiver burden. Second, as prior studies were conducted in the northern and central part of China, little is known with regard to caregiver burden among family caregivers of persons with dementia in Shanghai-- one of the most developed cities in China.</p>	<p>caregiver burnout was 15.5%. Caregiver burnout was associated with PWDs' ADL dependence and history of falls in the previous 90 days. Factors such as primary caregivers being adult children and the utilization of allied health services were found to be protective to caregiver burnout. As the social services and healthcare systems are different between Hong Kong and mainland China, factors contributing to caregiver burden may also differ between the two settings. Studies on caregiver burden of dementia caregivers conducted in northern cities of China showed that the average score of caregiver burden measured by the Zarit Burden Interview(ZBI) was 12.2 ± 13.2, which lies in the mild range. Moreover, caregiver burden was associated with the functional status of PWDs, physical status, life satisfaction, depression, and anxiety of caregivers¹⁴. The study conducted by Wang et al. in central China showed that the mean score of caregiver burden measured by the caregiver burden inventory was 44.56 ± 10.18. Caregiver burden was associated with the risk of caregiver's committed abuse. However, caregiver burden was not found to be associated with social support. Liu et al. reported that severity of dementia, daily caregiving time, depressive symptom, and anxiety of caregivers were associated with caregiver burden in Beijing . The novelty of our study is that the earlier studies did not include some key factors, such as positive aspects of caregiving, social support, and community service utilization, that could impact caregiver burden. Further, as prior studies were conducted in the northern and central parts of China, information regarding caregiver burden among</p>
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			<p>family caregivers of persons with dementia in Shanghai, which is one of the most developed cities in China, is limited. Data available for factors such as positive aspects of caregiving, perceived social support, and utilization of community services associated with the level of caregiver burden is sparse. To address the knowledge gap, this study is aimed to explore the level and factors associated with dementia caregivers' burden in communities in Shanghai. We hypothesize that the factors associated with caregiver burden are community service utilization, social support, and positive aspects of caregivers as well as the cognitive function, sleep quality, ability of daily life, the behavioral and psychological symptoms of PWDs.</p>
<p>Q2</p>	<p>Under the methodology section, page 5 "among these 2272 old adults, 500 old adults were selected randomly to receive Mini-Mental State Examination". Can the authors explain the selection for 500 elderly?</p>	<p>We used random seed generated by SAS to randomly select 500 old adults from 2272 old adults to receive Mini-Mental State Examination.</p>	<p>A total of 8800 older adults were randomly selected from seven community healthcare centers in Hongkou District, Shanghai, China. The healthcare providers in these community centers screened the cognitive function of 8549 older adults using the measure of Alzheimer's disease-8 (AD8), A score of 2+ was considered as cognitive impairment. A total of 2272 of the screened persons were designated as cognitively impaired out of which 500 persons were randomly selected using random seed generated by SAS. These selected individuals underwent further cognitive testing using the Mini-Mental State Examination (MMSE). A total of 456 older adults with cognitive impairment (MMSE < 26) were identified, and they were invited along with their primary family caregivers to the Neurology Clinic of Changzheng Hospital for further comprehensive neuropsychological assessment by neurologists. Seven dyads of PWDs</p>

			and their family caregivers refused to participate in the study. A total of 109 dyads of PWDs and their primary family caregivers consented to participate in the study.
Q3	The authors also stated that “patients and the public were not involved in the study”. Were the authors referring to the fact that the patients and public were not involved in the data management and analysis? This was unclear.	There was no patient or public involvement in framing the research question, choosing or disseminating the findings. We have added this point in the manuscript.	There was no patient or public involvement in framing the research questionnaire, selecting, or disseminating the findings.
Q4	May I also enquire which diagnostic criteria did the authors use for the subtypes of dementia in this study? The following are elaborations of my 'No' responses above:	All the patients met the NIA-AA criteria(2011) for probable Alzheimer's Disease(AD), the NINDS-AIREN criteria for vascular dementia (VaD), the Gorno-Tempini criteria (2011) for frontotemporal dementia, and dementia with Lewy body (DLB) clinical diagnostic criteria(2005) for Lewy bodies-associated dementia, and underwent thorough clinical examinations, medical history taking and assessment of the physical, neurological and psychiatric status, including the Hamilton Anxiety Scale; psychological test; laboratory screening test; electrocardiography (ECG); chest radiography; electroencephalography (EEG); magnetic resonance imaging (MRI) of the brain; neuropsychological assessment with the use of the mini mental state examination (MMSE); functional autonomy evaluation using activities of daily living scale.	A total of 116 older adults were diagnosed with dementia. All the PWDs met the NIA-AA criteria(2011) for probable Alzheimer's Disease(AD), the NINDS-AIREN criteria for vascular dementia (VaD), the Gorno-Tempini criteria (2011) for frontotemporal dementia, and dementia with Lewy body (DLB) clinical diagnostic criteria(2005) for DLB, and underwent thorough clinical examinations, medical history taking and assessment of the physical, neurological and psychiatric status, including the Hamilton Anxiety Scale; psychological test; laboratory screening test; electrocardiography (ECG); chest radiography; electroencephalography (EEG); magnetic resonance imaging (MRI) of the brain; neuropsychological assessment with the use of the mini-mental state examination (MMSE); functional autonomy evaluation using Activities of Daily Living Scale.
Q5	For the abstract, I have difficulty understanding what are “cope strategy of PWD” (line 40) and	As suggested, we have revised the abstract	Conclusion Dementia caregivers experienced a high level of caregiver burden. The cognitive

	<p>“moderate effect was tested” (line 42). The conclusions can be improved and elaborated e.g. the “various factors” of caregiver burden.</p>	<p>according to your suggestion.</p>	<p>function of PWD, PAC, social support, and community service utilization were factors associated with caregiver burden. Strengthening social support, providing more high-quality home care services, promoting positive aspects of caregiving are imperative to reduce caregiver burden.</p>
Q6	<p>For the references, I noted that there are several errors messages with ‘reference source not found’.</p>	<p>Thanks for your point. We have checked and corrected all the references.</p>	
Q7	<p>For the results, there may be an error in the percentage of females in PWD. Both caregivers and PWD were reported as 57.8% which differs from the data reported in Tables 2 & 3. There is also an error with the title for figure 2 and the x-axis detailing caregiver burden should be made clearer.</p>	<p>Thanks for pointing this out. We have checked and corrected the mistakes.</p>	<p>The mean age of the caregivers was 65.18±12.03. The percentage of females was 58.7%.</p>
Q8	<p>In the discussion, the authors concluded that the caregiver burden was relatively high in the first para (page 8 line 46) but the elaboration that it was relatively high compared to previous studies was mentioned only later in the second para. It may be clearer if the elaboration was made earlier.</p>	<p>Thank you very much for your comments; we have restructured the beginning of the DISCUSSION.</p>	<p>The level of caregiver burden in the present study was relatively higher than that in previous studies. The study conducted by Wang et al. in central China demonstrated that the average CBI score of dementia caregivers was 44.6 ±10.2. Liu et al. reported that the average CBI scores for caregivers with mild dementia, moderate dementia, and severe dementia were 19.63 ±10.75, 36.48 ±14.20, and 45.29 ±10.71, respectively in Beijing. This was a cross-sectional study to explore the level of caregiver burden and factors related to it in PWDs in communities of Shanghai. After controlling for covariates, PWDs’ cognitive function, PAC, social support, and community service needs were significantly associated with caregiver burden. Social support was a moderator for the relationship between caregiver burden and caregivers’ depressive symptoms.</p>

Q9	With reference to Page 9 “Firstly, present study has shown that worse cognitive function of PWDs and older age of PWDs was related to more caregiver burden, which was consistent with previous studies”, were those previous studies done in western populations? Are the authors able to make comparisons with more similar cultural groups or the previous studies in China alluded to earlier in the paper?	Thanks for your comments. We have clarified that we compared our results with previous studies in similar culture groups. We have revised the manuscript.	The study conducted by Wang et al. in central China demonstrated that the average CBI score of dementia caregivers was 44.6 ± 10.2 . Liu et al. reported that the average CBI scores for caregivers with mild dementia, moderate dementia, and severe dementia were 19.63 ± 10.75 , 36.48 ± 14.20 , and 45.29 ± 10.71 , respectively in Beijing.
Q10	With reference to Page 9 line 11, “Secondly, The differences of caregiver burden from similar samples between previous studies and present study...”, are the authors referring to the relatively high caregiver burden? If so, it should be stated more clearly.	Thank you very much for your comments. We have revised the manuscript.	The level of caregiver burden level in our study was relatively higher compared to that in western countries. It may be due to different social environments, cultures, healthcare policies, ethnicity, and age of caregivers.
Q11	The authors should also take note of grammatical errors and sentence structuring for this part of the discussion.	Thank you very much for your comments; we have asked a native English speaker to edit the manuscript and improved our grammar and sentence structure.	
Q12	Page 9 second last para “Previous studies also reported that the PAC was associated with the higher level of caregiver burden”. Is there an error in this statement? Should it be “Previous studies also reported that the PAC was associated with a lower level of caregiver burden”?	Thanks for your point. We have corrected the expression.	Previous studies also reported that the PAC was associated with a lower level of caregiver burden.
Q13	Page 9 last para “Utilization of community service may make caregivers experience more stigmatic feelings from their neighbors, friends or colleagues and further increase the level of caregiver burden” – how is this statement justified by the findings of this study?	Thanks for your point. We have revised the manuscript.	Community service is delivered at community healthcare centers, and caregivers need to bring PWD to use such service. The traffic between home and healthcare centers may increase caregiver burden. The reimbursement of community service by China’s healthcare insurance is limited. Without the support of insurance, community service utilization may cause an additional financial burden to dementia caregivers. It has been reported that informal

			dementia caregivers seldom used respite services ⁴⁴ . The gap between the needs of supportive community service and community service, especially home visiting service in a real environment is needed to be explored in the future.
Q1 4	The standard of written English needs to be improved, particularly for the discussion section.	Thank you very much for your comments; we have asked a native English speaker to edit the manuscript and improved the language.	
Reviewer: 2			
Q1	The paper needs to be restructured to focus on the stated objective of the study - to explore the factors for caregiver burden.	Thank you very much for your comments; We have restructured and revised the manuscript.	
Q2	The key construct is the Caregiver Burden Inventory which has 5 domains. However except for the Time Domain, it is unclear which of the data is used to calculate the other 4 Domains and the constructs of the domains	Thank you very much for your comments. We have added the information in the manuscript.	CBI included 24-items, which were divided into five domains. Each item was evaluated from “never” (0 points) to “always” (4 points) 5 levels. The five domains were: time-dependence (Items 1 to 5, with 20 points), developmental (Items 6 to 10, with 20 points), physical (Items 11 to 14, with 16 points), social (Items 15 to 18, with 16 points), and emotional (Items 19 to 24, with 24 points).
Q3	The 3 questions on social support cannot be equated with social burden.	We apologize for the confusion. Social burden was one of the five domains of the Caregiver Burden Inventory. We used three additional questions to measure the social support perceived by the caregivers.	
Q4	In the methods, only Self Rated Depression Scale is mentioned for assessing care givers 'Depression' No mention is made on how 'Emotional Burden' is calculated.	The emotional burden was one of the five domains of the Caregiver Burden Inventory.	CBI included 24-items, which were divided into five domains. Each item was evaluated from “never” (0 points) to “always” (4 points) 5 levels. The five domains were: time-dependence (Items 1 to 5, with 20 points), developmental (Items 6 to 10, with 20 points), physical (Items

			11 to 14, with 16 points), social (Items 15 to 18, with 16 points), and emotional (Items 19 to 24, with 24 points).
Q5	Table 2 under Disease characteristics is an item 'NPI total symptom scale' which relates to the patient' 'Care giver distress subscale' which cannot be equated with 'Emotional Burden'.	We have clarified that the emotional burden was one of the domains of the Caregiver Burden Inventory. Caregiver distress subscale is a part of the NPI. They are different. We have deleted the subscale of NPI in table 2 in order to avoid confusion.	
Q6	There are a number of related measurements such as 'Positive Aspects of caregiving' PAC but no data in the results other than an item 'Positive feeling of caregivers'.	Sorry for the confusion. We referred 'Positive feeling of caregivers' as 'Positive Aspects of caregiving'. We have revised the expression.	
Q7	The analysis in the results section should clearly demonstrate which data is used to calculate each of the 5 domains of caregiver burden.	Thanks for your comments. We have added the information in the measurement part.	CBI included 24-items, which were divided into five domains. Each item was evaluated from "never" (0 points) to "always" (4 points) 5 levels. The five domains were: time-dependence (Items 1 to 5, with 20 points), developmental (Items 6 to 10, with 20 points), physical (Items 11 to 14, with 16 points), social (Items 15 to 18, with 16 points), and emotional (Items 19 to 24, with 24 points).
Q8	Reference should also be made to the validated instrument in the data required for each of the 5 domains.	Thanks for your point. We have added the information in the measurement part.	The Cronbach α coefficients of the five domains ranged from 0.79 to 0.93. The content of validity index (CVI) of the Chinese version was 95.8%. The exploratory factor analysis showed that there were five common factors for the original scale. The accumulative variance contribution of the five common factors was 62.78%
Q9	ABSTRACT: Information mentioned in the Methods should match that in the Results: MoCA was mentioned in Results only.	Thanks for your point. We have added the information of MoCA in the abstracts.	Main outcome measure Caregiver burden measured by the Caregiver Burden Inventory (CBI) and the Caregivers' depressive symptom measured by the simplified Chinese

			<p>version of Self-rating Depression Scale (SDS) was the outcome variable of the study. The independent variables, including the cognitive function (measured by Montreal Cognitive Assessment (MoCA), sleep quality assessed by the Pittsburgh Sleep Quality Index (PSQI), abilities of daily life assessed by the Activities of Daily Living Scale (ADL), and behavioral and psychological symptoms assessed by the Neuropsychiatric Inventory (NPI) of PWDs, the community service utilization (measured by the Community Service Utilization Measurement), perceived social support (assessed by three questions), positive aspects of caregiving (assessed by the Positive Aspects of Caregiving, PAC) of dementia caregivers were analyzed.</p>
Q10	<p>ABSTRACT: In Results, it was mentioned that “social support moderated the relationship between the caregiver burden and caregiver’s depression” but the measurement for “depression” was not identified (CBI only measures “emotional burden”, which is not equal to clinical ‘depression’ (e.g. MDD); burden is only the ‘cost’ of caregiving but not necessarily a disorder).</p>	<p>Thanks for your point. We have added the information about caregivers’ depressive symptom in the measurement part.</p> <p>Depressive symptom of caregivers is self-reported depressive symptoms and it is not equal to a clinical depression diagnosis.</p>	<p>The caregivers’ depressive symptom was measured by the Self-rating Depression Scale (SDS) developed by Zung in 1965 to measure the level of depression of adults (Zung,1965). We used a simplified Chinese version that includes 12 items and has been used in the previous study (Chen,2018).</p>
Q11	<p>ABSTRACT: Same comments for ‘depression’ in Conclusion.</p>	<p>Thanks for your point. We have revised the text.</p>	
Q12	<p>ABSTRACT: Reference should be given to interpret CBI scores.</p>	<p>Thanks for your point. We have added the information in the abstract.</p>	<p>The level of caregiver burden of PWD resident in Shanghai communities was high.</p>
Q13	<p>STRENGTH AND LIMITATION: P.3 line 1: “The conclusion of our study may provide the strategy of reducing the caregiver burden of PWDs’ caregivers.” There is limited information and analysis of factors for caregiver burden, inform strategy for reducing the load.</p>	<p>Thanks for your point. We have revised the expression in the Strengths and limitations.</p>	<p>Strengths and limitations of this study</p> <ul style="list-style-type: none"> • The study was conducted in Shanghai, which is the most aging city in China. • The participants were randomly sampled from a convenient sample of 8,800

			<p>older adults in seven different communities.</p> <ul style="list-style-type: none"> • Factors related to PWDs as well as their family caregivers were included in the study. • The conclusion of the present study needs to be interpreted with caution since the socioeconomic status, healthcare services, and cultural behavior vary between different regions of China.
Q1 4	<p>STRENGTH AND LIMITATION: P.3 line 3: The sampling frame is a plus to the generalizability of this study, which would need further support from a more detailed account of the sampling methods (e.g. convenient samplings from large dementia clinics (that service > 500 populations) in the regions?</p>	<p>Thanks for your point. We have added the detailed information in the methods part.</p>	<p>A total of 8800 older adults were randomly selected from seven community healthcare centers in Hongkou District, Shanghai, China. The healthcare providers in these community centers screened the cognitive function of 8549 older adults using the measure of Alzheimer's disease-8 (AD8), A score of 2+ was considered as cognitive impairment. A total of 2272 of the screened persons were designated as cognitively impaired out of which 500 persons were randomly selected using random seed generated by SAS. These selected individuals underwent further cognitive testing using the Mini-Mental State Examination (MMSE). A total of 456 older adults with cognitive impairment (MMSE < 26) were identified, and they were invited along with their primary family caregivers to the Neurology Clinic of Changzheng Hospital for further comprehensive neuropsychological assessment by neurologists. Seven dyads of PWDs and their family caregivers refused to participate in the study. A total of 109 dyads of PWDs and their primary family caregivers consented to participate in the study.</p>
Q1 5	<p>INTRODUCTION: P.3 line 38: this is good to include the cost of dementia in China to illustrate the importance of caregivers as the major lay care provider to PWD. See Xu, J., Wang, J., Wimo, A., Fratiglioni, L., & Qiu, C. (2017). The economic burden of</p>	<p>Thank you very much for your comments. We have added the information in the instruction.</p>	<p>Dementia also has a financial impact on society. The estimated total annual cost of dementia in China is predicted to increase from 0.9 billion US dollars (US\$) in 1990 to 114.2 billion US\$ in 2030. The costs of informal care accounted for</p>

	dementia in China, 1990-2030: implications for health policy. Bulletin of the World Health Organization, 95(1), 18–26. https://doi.org/10.2471/BLT.15.167726 .		81.3% of the total estimated cost in 2010.
Q1 6	INTRODUCTION: p.4 line 1 Study was done in Hong Kong to explore risk factors contributing factors to cost of caregiving and the protective effect of community care services. See Chan, C.Y., Cheung, G., Martinez-Ruiz, A. et al. Caregiving burnout of community-dwelling people with dementia in Hong Kong and New Zealand: a cross-sectional study. BMC Geriatr 21, 261 (2021). https://doi.org/10.1186/s12877-021-02153-6 .	Thank you very much for your advice. We have added the information in the instruction.	A cross-section study in Hong Kong revealed that the prevalence of caregiver burnout was 15.5%. Caregiver burnout was associated with PWDs' ADL dependence and history of falls in the previous 90 days. Factors such as primary caregivers being adult children and the utilization of allied health services were found to be protective to caregiver burnout. As the social services and healthcare systems are different between Hong Kong and mainland China, factors contributing to caregiver burden may also differ between the two settings. Studies on caregiver burden of dementia caregivers conducted in northern cities of China showed that the average score of caregiver burden measured by the Zarit Burden Interview(ZBI) was 12.2 ± 13.2 , which lies in the mild range. Moreover, caregiver burden was associated with the functional status of PWDs, physical status, life satisfaction, depression, and anxiety of caregivers. The study conducted by Wang et al. in central China showed that the mean score of caregiver burden measured by the caregiver burden inventory was 44.56 ± 10.18 . Caregiver burden was associated with the risk of caregiver's committed abuse.
Q1 7	INTRODUCTION: P.4 line 7: Same as #2. Burden and depression (and anxiety) are usually tested separately in caregiver research, where the former one could be the emotional strain multifaceted with health, mental, and social cost of caregiving, and in a factor for depression and anxiety. You might check Liu, Z.,	Thank you very much for your advice. We have added the information in the instruction.	Psychological health deterioration is one of the consequences of caregiver burden. Caregivers experience psychological issues like depression and anxiety after caring for persons with dementia for a long period of time. Social support refers to an individual or a collective resource that can provide emotional

	<p>Heffernan, C., & Tan, J. (2020). Caregiver burden: A concept analysis. <i>International journal of nursing sciences</i>, 7(4), 438–445. https://doi.org/10.1016/j.ijnss.2020.07.012 and Sherwood, P. R., Given, C. W., Given, B. A., & von Eye, A. (2005). Caregiver Burden and Depressive Symptoms: Analysis of Common Outcomes in Caregivers of Elderly Patients. <i>Journal of Aging and Health</i>, 17(2), 125–147. https://doi.org/10.1177/0898264304274179 for a more general understanding on caregiver burden.</p>		<p>and mental assistance. The study conducted by Cohen and Thoits proposed and verified the buffering hypothesis and confirmed that social support is a buffer against life stress and protects physical and mental health. As for dementia caregivers, the antecedents of caregiver burden consist of insufficient financial resources, multiple responsibilities, and lack of social activities. Adequate social support from family and community can release stress and burden of caregivers and allow them to participate in social activities. We propose that with different levels of social support, the impact of caregiver burden on depressive symptom vary.</p>
Q1 8	<p>INTRODUCTION: P.4 line 21: In this paragraph, the authors illustrated the significance of dementia caregiver burden in China through the lens of healthcare system and cultural difference. This is important to test and discuss the political & cultural determinants on the Chinese caregivers' evaluation on the caregiving burden, and how does it impact on the structure of risk factors contribute to the understandings of caregiving activities for PWD in this landscape. This has to be strengthened in both INTRODUCTION and DISCUSSION sections of this paper.</p>	<p>Thank you very much for your comments. We have added the information in the introduction and discussion.</p>	<p>Introduction: Furthermore, the Chinese are influenced by Confucianism, which promotes the value of filial piety and family responsibility. Especially, in traditional Chinese culture, family secrets should be confined to family members and not be revealed to those outside the family. The cultural sense of caregiving obligation may be a barrier for caregivers to seek help outside of the household, which leads to a high level of caregiver burden. Therefore, we aim to conduct this study to examine the level of dementia caregiving burden in Chinese communities and explore the factors related to caregiver burden. Besides, we also explored the relationship between social support, depression of caregivers, and caregiver burden. The results of the study may provide insight into the development of programs and services to reduce caregiver burden.</p> <p>Discussion: A cultural sense of caregiving obligation may augment the distress and burden felt by the caregivers. Sharing family affairs</p>

			with outsiders is not acceptable in Chinese culture. A strong sense of family responsibility may prevent caregivers from sharing their caregiving burnout with others. These aspects are not conducive to releasing the burden of caregiving.
Q1 9	INTRODUCTION: The hypothesis of this study is unclear.	Thank you very much for your comments. We have added the information in the instruction.	Data available for factors such as positive aspects of caregiving, perceived social support, and utilization of community services associated with the level of caregiver burden is sparse. To address the knowledge gap, this study is aimed to explore the level and factors associated with dementia caregivers' burden in communities in Shanghai. We hypothesize that the factors associated with caregiver burden are community service utilization, social support, and positive aspects of caregivers as well as the cognitive function, sleep quality, ability of daily life, the behavioral and psychological symptoms of PWDs.
Q2 0	PARTICIPANTS AND METHODS: The randomized nature of the sampling method could be a strong plus to the generalizability to the study and ought to be emphasized in both abstract and strengths of this study.	Thank you very much for your comments. We have added the information in abstract and strengths.	ABSTRACT Participants A random sample of 109 older adults with dementia and their primary family caregivers. Strengths and limitations <ul style="list-style-type: none"> The participants were randomly sampled from a convenient sample of 8,800 older adults in seven different communities.
Q2 1	PARTICIPANTS AND METHODS: A flow chart could help to illustrate the sampling method.	We have added the flow chart in the figures.	
Q2 2	PARTICIPANTS AND METHODS: The calculation of the power of the sample size to detect significance of the estimated differences of the variables in predicting the outcome should be given. The basis of the	Thank you very much for your comments.	The power of the sample size was calculated by the G*power 3.1; we chose Linear multiple regression: Fixed model, single regression coefficient. The effect size f2 was set as a large of 0.35, the number

	estimated differences should also be given.		of predictors was 7, the results showed that the power of the sample was 99.81%, indicating a sound power of the test.
Q2 3	PARTICIPANTS AND METHODS: P.5 line 25: Please specify that the Chinese version of CBI was used. Was the validity of CBI tested in mainland China/ Shanghai landscape? If yes, relevant citations should be included.	Thank you very much for your comments. We have added the information in the Methods part.	The Cronbach α coefficients of the five domains ranged from 0.79 to 0.93. The content of validity index (CVI) of the Chinese version was 95.8%. The exploratory factor analysis showed that there were five common factors for the original scale. The accumulative variance contribution of the five common factors was 62.78%. The inventory was used to measure the caregiver burden of dementia caregivers in central China, with a Cronbach α coefficient of 0.92
Q2 4	PARTICIPANTS AND METHODS: page 5, line 50: please include description of measures on caregiver depression in the ABSTRACT page 5, line 50: caregivers' depression is more likely an outcome of caregiver burden.	Thanks for your comments. We have added the measurement in the abstracts.	Caregiver burden measured by the Caregiver Burden Inventory (CBI) and the Caregivers' depressive symptom measured by the simplified Chinese version of Self-rating Depression Scale (SDS) was the outcome variable of the study. The independent variables, including the cognitive function (measured by Montreal Cognitive Assessment (MoCA), sleep quality assessed by the Pittsburgh Sleep Quality Index (PSQI), abilities of daily life assessed by the Activities of Daily Living Scale (ADL), and behavioral and psychological symptoms assessed by the Neuropsychiatric Inventory (NPI) of PWDs, the community service utilization (measured by the Community Service Utilization Measurement), perceived social support (assessed by three questions), positive aspects of caregiving (assessed by the Positive Aspects of Caregiving, PAC) of dementia caregivers were analyzed. Multivariate linear regression was employed to determine the factors related to caregiver burden.

Q2 5	PARTICIPANTS AND METHODS: p.5 line 56: Please noted that utilization of community services use is not equivalent to services needs as the authors have written in the ABSTRACT (p.2 line 40 “community service’s needs”). Needs is a capacity to benefit from better intervention/ treatment, that could be expressed, felt, normative. Please see Bradshaw’s explanation on this. Bradshaw, Jonathan. (1972). A Taxonomy of Social Need. New Society. 30.	Thanks for your comments. We have revised the expression.	Main outcome measure Caregiver burden measured by the Caregiver Burden Inventory (CBI) and the Caregivers’ depressive symptom measured by the simplified Chinese version of Self-rating Depression Scale (SDS) was the outcome variable of the study. The independent variables, including the cognitive function (measured by Montreal Cognitive Assessment (MoCA), sleep quality assessed by the Pittsburgh Sleep Quality Index (PSQI), abilities of daily life assessed by the Activities of Daily Living Scale (ADL), and behavioral and psychological symptoms assessed by the Neuropsychiatric Inventory (NPI) of PWDs, the community service utilization (measured by the Community Service Utilization Measurement), perceived social support (assessed by three questions), positive aspects of caregiving (assessed by the Positive Aspects of Caregiving, PAC) of dementia caregivers were analyzed. Multivariate linear regression was employed to determine the factors related to caregiver burden. Results Community service utilization was positively associated ($\beta=3.46$, $p<0.001$) with caregiver burden.
Q2 6	PARTICIPANTS AND METHODS: For a more accurate understanding of parameter for services utilization & social support, please specify the timeframe for the use of services (e.g. in the past 7 days).	Thanks for your comments. We have added the information. The timeframe “community service utilization” was the service used in the past three months.	Caregivers were asked to choose the community service they had used in the past three months..
Q2 7	PARTICIPANTS AND METHODS: P.7 line 33: Please specify the p value adopted for purposive selection of covariate in univariate regression ($p<0.1$) . A different alpha should be set for purposive selection. See Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008).	Thanks for your point. When selected the covariate in the univariate regression, the p-value was set as $p<0.1$. It was explained in the ‘Data analysis’ part.	The statistically significant value of the univariate linear regression was set as $p < 0.1$ (Bursac,2008).

	Purposeful selection of variables in logistic regression. Source code for biology and medicine, 3, 17. https://doi.org/10.1186/1751-0473-3-17 .		
Q2 8	RESULTS: There were some grammatical and language errors. Please refer to the section "OTHERS".	Thank you very much for your comments. We have corrected the errors.	
Q2 9	DISCUSSION: P.8 line 46: "The level of caregiver burden was relatively high." Please discuss with reference to a comparable population (e.g. Chinese) / culture (e.g. Korean/ Japanese as two clans that inherit the tradition of Confucianism. See Chan S, W, -C: Family Caregiving in Dementia: The Asian Perspective of a Global Problem. Dement Geriatr Cogn Disord 2010;30:469-478. doi: 10.1159/000322086.	Thank you very much for your comments. We have compared our result with that in other a comparable population (e.g. Chinese) / culture (e.g. Korean/ Japanese).	The level of caregiver burden in the present study was relatively higher than that in previous studies ^{15,16} . The study conducted by Wang et al. in central China demonstrated that the average CBI score of dementia caregivers was 44.6 ±10.215. Liu et al. reported that the average CBI scores for caregivers with mild dementia, moderate dementia, and severe dementia were 19.63 ±10.75, 36.48 ±14.20, and 45.29 ±10.71, respectively in Beijing
Q3 0	OTHERS: Minor typos/unclear phrases/ typesetting inconsistencies were identified: p.2 line 40: cope strategy(ies) (of) p.2 line 44: Result(s) p.2 line 48: double spacing after "Besides, " p.3 line 27, 38, 54, 60: reference source is missing p.7 line 56 "Among 109 PWDs, 83 (76.1%) with high school education or above, 12(11.0%) middle school, 7(6.4%) primary school, and 7(6.4%) illiteracy." There is no verb in this sentence. p.8 line 3 "dementia patients' please avoid stigmatizing language.	Thank you very much for your comments. We have corrected the errors.	p.2 line 40: Main outcome measure Caregiver burden measured by the Caregiver Burden Inventory (CBI) and the Caregivers' depressive symptom measured by the simplified Chinese version of Self-rating Depression Scale (SDS) was the outcome variable of the study. The independent variables, including the cognitive function (measured by Montreal Cognitive Assessment (MoCA), sleep quality assessed by the Pittsburgh Sleep Quality Index (PSQI), abilities of daily life assessed by the Activities of Daily Living Scale (ADL), and behavioral and psychological symptoms assessed by the Neuropsychiatric Inventory (NPI) of PWDs, the community service utilization (measured by the Community Service Utilization Measurement), perceived social support (assessed by three questions), positive aspects of caregiving (assessed by the Positive Aspects of Caregiving,

			<p>PAC) of dementia caregivers were analyzed.</p> <p>p.24 line 44: Results</p> <p>p.2 line 48: the Abstract has been all revised.</p> <p>p.3 line 27, 38, 54, 60: All the references were reinserted in the manuscript.</p> <p>p.7 line 56: Among 109 PWDs, 83 (76.1%) have received education till high school education or above, 12(11.0%) studied till middle school, 7(6.4%) till primary school, and 7(6.4%) were illiterate.</p> <p>p.8 line 3: all the 'dementia patients' in the manuscript have been changed to 'people with dementia'.</p>
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VERSION 2 – REVIEW

REVIEWER	Yeoh, EK Chinese University of Hong Kong
REVIEW RETURNED	08-Feb-2022

GENERAL COMMENTS	<p>The paper has been significantly improved after the revisions made in response to the comments.</p> <p>There remain a number of outstanding issues which should be addressed in the in introduction, methods, results and discussion.</p> <p>Introduction and Methods :</p> <p>There are two interrelated objectives of the study the first is clearly stated as in the Hypothesis in Page 2 Line 58. Examine how person and caregiver variables affect caregiver burden.This could be better presented by changing the order of the hypothesis, mentioing the patient variables first. It would also be informative to elaborate in both the introduction and enriched in your discussion, the significance of 'positive aspects of caregivers' on care giver burden.</p> <p>The second objective which is only mentioned in the data analysis in Page 9 Line19 is examine the moderating effect of social support on the relationship between caregiver burden and caregivers' depressive symptoms. This should presented both in the introduction and the methods. The basis for this should be presented, particularly why this was chosen for examination and why not the other 2 caregiver variables, namely, 'positive aspects of caregivers'[PAC] and community services utilization.</p>
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	<p>It is also important to clarify what is measured is not community care needs but community care utilization.</p> <p>Findings : In Page 9 Line 56 and Page 10 Line 9. the reference to the social support of caregivers should be qualified by 'the level of social support' to facilitate understanding of the effect.</p> <p>In Page10 Line 1 Community service needs should be replaced as community service utilization as this is what was measured, community service needs is a more complex measure which depends on a set of variables, including the biophysical and psychosocial status of the individual, caregivers, availability of, and costs and access to services and public policies. One explanation for the positive association could be 'unmet needs' ie. the availability of, or access to, the community services.</p> <p>Discussion : The discussion would benefit from an elaboration of the issues I have highlighted on the findings of the positive correlation of community service utilization and caregiver burden. p.9 line 19 and page 10 line 5: This is interesting to know that the burden level of your sample is higher than previous studies conducted in China. Are there any possible justifications behind? What features in the Shanghai LTC system may be contributing to this phenomenon? p.10 line 31: In your sample, what is the significance of identifying PAC as the protective factor of excessive caregiver burden risk? Among the domains of PAC, which contributed the most to the protective effect on burden? You might consider doing a sub-analysis on testing the sub-scale score of PAC on burden to find it out and discuss PAC's role on burden more in depth.</p>
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 2 Dr. EK Yeoh, Chinese University of Hong Kong			
Introduction and Methods			
Q2	<p>There are two interrelated objectives of the study the first is clearly stated as in the Hypothesis in Page 2 Line 58.</p> <p>Examine how person and caregiver variables affect caregiver burden. This could be better presented by changing the order of the hypothesis, mentioning the patient variables first. It would also be informative to</p>	<p>Thank you very much for your comments. We have changed the order of the hypothesis.</p>	<p>We hypothesized that the factors associated with caregiver burden were cognitive function, sleep quality, ability of daily life, the behavioral and psychological symptoms of PWDs as well as community service utilization, social support, and positive aspects of caregivers.</p> <p>Introduction:</p> <p>Abdollahpour et al. reported that positive aspects of caregiving was</p>

	elaborate in both the introduction and enriched in your discussion, the significance of 'positive aspects of caregivers' on caregiver burden.		negatively associated with caregiver burden among 153 caregivers of people with Alzheimer's disease after controlling for caregivers' age, marriage, and dependence of patients <small>Error! Reference source not found.</small>
Q3	The second objective which is only mentioned in the data analysis in Page 9 Line19 is examine the moderating effect of social support on the relationship between caregiver burden and caregivers' depressive symptoms. This should presented both in the introduction and the methods. The basis for this should be presented, particularly why this was chosen for examination and why not the other 2 caregiver variables, namely, 'positive aspects of caregivers'[PAC] and community services utilization.	<p>Thanks for your suggestion. We have presented examining the moderating effect of social support on the relationship between caregiver burden and caregivers' depressive symptoms both in introduction and methods.</p> <p>We have examined the moderating effect of positive aspects of caregiving and community service utilization between caregiver burden and depressive symptoms. However, the moderating effect of positive aspects of caregiving and community service utilization were not significant ($p=0.74$, $p=0.29$ respectively). So we did not present examining moderating effect of positive aspects of caregiving and community service utilization in introduction or results of the manuscript.</p>	Psychological health deterioration is one of the consequences of caregiver burden ¹² . Caregivers experience psychological issues like depression and anxiety after caring for persons with dementia for a long period of time ¹⁴ . Social support refers to an individual or a collective resource that can provide emotional and mental assistance ¹⁹ . The study conducted by Cohen and Thoits proposed and verified the buffering hypothesis and confirmed that social support is a buffer against life stress and protects physical and mental health. As for dementia caregivers, the antecedents of caregiver burden consist of insufficient financial resources, multiple responsibilities, and lack of social activities. Adequate social support from family and community can release stress and burden of caregivers and allow them to participate in social activities. A cross-sectional study among people with Alzheimer's disease in Taiyuan the North China showed that social support was the moderating variable in the relationship between the cognitive function of people with AD and caregiver burden. It can be seen that social support can buffer the negative aspects of caring for people with dementia. We propose that with different levels of social support, the impact of caregiver burden on depressive symptom vary, the social support is the moderating variable in the relationship

			between caregiver burden and depressive symptoms.
Q4	It is also important to clarify what is measured is not community care needs but community care utilization.	Thank you very much for your comments. We have clarified what we measured was community care utilization.	<p>The results of univariate and multivariate linear regression are shown in Table 4. PWD age, MoCA, PAC, community service utilization, and social support all had a significant impact on caregiver burden. MoCA, PAC, and social support of caregivers were negatively associated with caregiver burden ($\beta=-0.84$, $p < 0.001$, $\beta=-3.61$, $p = 0.03$, and $\beta=-1.22$, $p = 0.001$, respectively), which indicated better PWDs' cognitive function, more PAC and a higher level of social support were related to less caregiver burden. The community service utilization were positively associated with caregiver burden ($\beta= 3.46$, $p < 0.001$), which indicated more community service utilization were related to more caregiver burden.</p> <p>This was a cross-sectional study to explore the level of caregiver burden and factors related to it in PWDs in communities of Shanghai. After controlling for covariates, PWDs' cognitive function, PAC, social support, and community service utilization were significantly associated with caregiver burden.</p>
Q5	Findings:		
Q6	In Page 9 Line 56 and Page 10 Line 9. the reference to the social support of caregivers should be qualified by 'the level of social support' to facilitate understanding of the effect.	Thank you very much for your comments. We have revised the expression.	<p>PWD age, MoCA, PAC, community service utilization, and the level of social support all had a significant impact on caregiver burden.</p> <p>The level of social support independently contributed to caregivers' depressive symptom.</p>
Q7	In Page10 Line 1	Thank you very much for your points. We have revised to the expression to community care	The results of univariate and multivariate linear regression were shown in Table 4. PWD age,

	<p>Community service needs should be replaced as community service utilization as this is what was measured, community service needs is a more complex measure which depends on a set of variables, including the biophysical and psychosocial status of the individual, caregivers, availability of, and costs and access to services and public policies. One explanation for the positive association could be 'unmet needs' i.e. the availability of, or access to, the community services.</p>	<p>utilization. We have discussed the positive association in discussion below.</p>	<p>MoCA, PAC, community service utilization, and the level of social support all had a significant impact on caregiver burden.</p> <p>The community service utilization were positively associated with caregiver burden ($\beta= 3.46$, $p < 0.001$), which indicated more community service utilization were related to more caregiver burden.</p>
	Discussion		
Q8	<p>The discussion would benefit from an elaboration of the issues I have highlighted on the findings of the positive correlation of community service utilization and caregiver burden.</p>	<p>Thank you very much for your comments. We have elaborated the positive correlation of community service utilization and caregiver burden.</p>	<p>Community service was delivered at community healthcare centers. Caregivers needed to take PWD to community healthcare centers to accept such services. The traffic between home and community healthcare centers may increase caregiver burden. The reimbursement of community service by China's healthcare insurance is limited. Without the support of insurance, community service utilization may cause an additional financial burden to dementia caregivers. It has been reported that informal dementia caregivers seldom used respite services⁴⁷. The service provided in the communities healthcare centers is limited and it has not met the needs of PWDs' caregivers. The gap between the diverse needs of PWDs' caregivers and limited supportive community services, especially home visiting services is needed to be closed in the future.</p>
Q9	<p>p.9 line 19 and page 10 line 5: This is interesting to know that the burden level of your sample is higher than previous studies conducted in China.</p>	<p>Thanks for your points. We have explained the possible reason why the burden level of our sample is</p>	<p>The caregiver burden level of our study was higher than that in previous studies conducted in Central and Northern China. It may be due to the different</p>

	<p>Are there any possible justifications behind? What features in the Shanghai LTC system may be contributing to this phenomenon?</p>	<p>higher than in previous studies conducted in China.</p> <p>The participants in our study from Hongkou District of Shanghai hadn't been covered by Shanghai LTC policy during the interview period. So Shanghai LTC policy hadn't contributed to the phenomenon.</p>	<p>sample sources. Our participants were all from the general communities. Wang's study sampled from the Clinical medical Center of Dementia and Cognitive Impairment in Hubei Province while Liu's Study sampled from 24 military communities in Beijing. The participants from the clinical center were able to get professional guidance while the participants from the military community can easily get the service and supplies from the military support compared to the general communities.</p>
	<p>p.10 line 31: In your sample, what is the significance of identifying PAC is the protective factor of excessive caregiver burden risk? Among the domains of PAC, which contributed the most to the protective effect on burden? You might consider doing a sub-analysis on testing the sub-scale score of PAC on burden to find it out and discuss PAC's role on burden more in depth.</p>	<p>Thank you very much for your comments. We have added the analysis.</p>	<p>For further analysis, after controlling for age, MoCA, NPI, ADL of PWDs, social support, and community service utilization to caregiver burden, the regression analysis showed that the outlook of life (sub-domain of PAC) was associated with caregiver burden ($\beta=-0.45$, $p<0.001$) while the association of self-affirmation(sub-domain of PAC) and caregiver burden was not statistically significant ($\beta=0.14$, $p=0.25$). The outlook of life contributed the most to the protective effect on caregiver burden.</p>