

A cross-sectional study on the need for and utilization of assistive walking devices by people age 55 and older in Shanghai

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SUMMARY We conducted a study to analyze the unmet needs of and risk factors for use of assistive walking devices by the elderly based on sample survey data from Shanghai, China from July to October 2019. Among a total sample size of 11,193 people age 55 and older, 1,947 people (17.39%) needed assistive walking devices, 829 (42.58%) of whom needed but did not use those devices. Multivariate analysis indicated that residence, living alone or cohabitating, indoor handrails, the number of diseases, and IADL were factors influencing the unmet need for assistive walking devices ($p < 0.05$, respectively). People who lived in community health centers ($p = 0.0104$, OR = 1.956, 95% CI: 1.171-3.267) and those who lived only with their spouse ($p = 0.0002$, OR = 2.901, 95% CI: 1.641-5.126) were more likely to have an unmet need for assistive walking devices. People without indoor handrails ($p = 0.0481$, OR = 0.718, 95% CI: 0.517-0.997), those with 3 or more diseases ($p = 0.0008$, OR = 0.577, 95% CI: 0.418-0.796), and those with severely impaired IADL ($p = 0.0002$, OR = 0.139, 95% CI: 0.05-0.386) were less likely to have an unmet need for assistive walking devices. Self-perceived needs of the elderly, the diversity and performance of assistive devices, and the accessibility and affordability of assistive walking devices may lead to unmet needs.

Keywords elderly, assistive walking devices, need, utilization, Shanghai

In recent years, China's aging population has continuously increased. The 2020 national population census indicated that the population age 65 and older accounted for 13.52% of the total population, or about 190 million people (1). Shanghai is one city with the earliest signs of aging in China (2). In 2020, the population age 65 and older in Shanghai accounted for 16.28% of the total population, or about 4.05 million people (1). The increase in the elderly population in China is accompanied by an increase in the proportion of disabled and semi-disabled people (3). The number of disabled or semi-disabled people in China was 48.09 million in 2020 and will be 120 million in 2050 (4). As the proportion of the elderly and disabled increase, the ability of the elderly to go out or walk safely may diminish (5), and their need for assistive walking devices is likely to grow (6-7).

Studies have indicated that the use of assistive walking devices differs among the elderly (8-14).

However, there are limited empirical studies on the need for and utilization of assistive walking devices by the elderly in China. Therefore, a study was conducted to analyze the unmet need for and risk factors for use of assistive walking devices by the elderly in Shanghai.

Study design

Subjects Data were collected in Shanghai, China on the elderly age 55 and older living in the community and nursing homes in 16 districts of Shanghai from July to October in 2019. Fifteen thousand copies of a questionnaires were sent out, and 14,944 copies were returned, for a return rate of 99.6%. Three thousand seven hundred and fifty-one subjects who were bedridden for a prolonged period, who had severe cognitive impairment, who were blind, or who lacked light perception were excluded, for a total of 11,193 subjects.

Methodology A matching analysis was performed

for the need for and utilization of assistive walking devices by the elderly. First, screening criteria were used to determine whether the elderly need to use assistive walking devices. Based on the collective standards of the Chinese Geriatrics Society and the Unified Elderly Care Needs Assessment, the Barthel Index scale, a simple psychiatric examination scale (MMSE), and several verification questions in the Unified Elderly Care Needs Assessment ("Do I need help changing from one sitting position to another?" and "Do I need help walking about 5 meters on flat ground?"), elderly people with a lower limb disorder, difficulty walking, or instability who needed to use walking aids were screened out (those who were bedridden for a prolonged period, who had severe cognitive impairment, who were blind, or who lacked light perception were excluded). Second, criteria were used to determine whether the elderly use assistive walking devices. Based on the question "What aids do you commonly use?" in the Unified Elderly Care Needs Assessment, whether the elderly use assistive walking devices and the type of device were determined. These assistive walking devices are crutches, wheelchairs, artificial limbs, or rollators.

Statistical analysis Descriptive statistics were used to analyze the need for and utilization of assistive walking devices by the elderly in Shanghai, and the quantitative data were described by frequency and component ratio. Logistic regression analysis was used for univariate and multivariate analysis. In a model of elderly people who need assistive walking devices, the dependent variable was whether assistive walking devices were used (0 = need and use (control group), 1 = need but do not use). The independent variables were sex, age, level of education, main source of income, residence, language use, living alone or cohabitating, physical care needs of the assessed subjects, elevators in one's residence, indoor steps, indoor handrails, number of diseases, IADL, and the self-rated health status of the elderly. A level of $\alpha = 0.05$ or $p < 0.05$ was considered statistically significant. The statistical software SAS9.4 was used to analyze data.

Comparison of characteristics of elderly with unmet needs and met needs for assistive walking devices

The total sample for this study was 11,193 subjects. Of those, 1,472 used assistive walking devices, accounting for 13.15%. Of the total, 1,947 subjects needed assistive walking devices, accounting for 17.39%, and of those, 829 needed but did not use assistive walking devices, accounting for 42.58%.

Compared to the elderly whose needs were met, the characteristics of the elderly with unmet need for assistive walking devices were as follows: 55-59 years of age (23 subjects, 60.53%), 60-69 years of age (159 subjects, 59.55%), a senior high school education (163 subjects, 52.24%), an unstable financial status

(16 subjects, 64.00%), living in a rented dwelling (79 subjects, 50.97%), living only with their spouses (227 subjects, 57.32%), with 0 diseases (69 subjects, 53.49%), normal ADL (184 subjects, 92.93%), self-reliant in IADL (149 subjects, 89.22%), and a very good self-rated health status (48 subjects, 67.61%) (Table 1).

Results indicated that assistive walking devices are underutilized (13.15%) by the elderly in Shanghai, and this figure is slightly higher than that in a previous study in three provinces in China (Sichuan, Chongqing, Inner Mongolia, assistive devices of an unspecified type, 10.9%) (13). This figure is also higher than that in a previous study in elderly with hearing loss (7.62%) (12). However, this figure is lower than that in a previous study that estimated that 16.6% of older adults use an assistive device outdoors in the US (6). Moreover, this figure is much lower than that in a previous study on use of assistive walking devices by disabled elderly (96%) (14).

Results also indicated that 42.58% of the elderly in Shanghai have an unmet need for assistive walking devices, which is slightly lower than the figure in a previous study in northern and southwestern China (the self-perceived need for assistive devices among the elderly was 46.1%) (13).

Residence, living alone or cohabitating, indoor handrails, number of diseases, and IADL were factors influencing the unmet need for assistive walking devices

Univariate analysis revealed significant differences in the use of assistive walking devices among the elderly who need them ($n = 1,947$) in terms of independent variables, such as age, level of education, financial status, residence, living alone or cohabitating, the physical need for care of the assessed subjects, an elevator in one's residence, the number of diseases, IADL, and self-rated health status. Multivariate analysis revealed that residence, living alone or cohabitating, indoor handrails, the number of diseases, and IADL were the factors influencing the unmet need for assistive walking devices ($p < 0.05$, respectively). People who lived in community health centers ($p = 0.0104$, OR = 1.956, 95% CI: 1.171-3.267) and those who lived only with their spouse ($p = 0.0002$, OR = 2.901, 95% CI: 1.641-5.126) were more likely to have an unmet need for assistive walking devices. Those without indoor handrails ($p = 0.0481$, OR = 0.718, 95% CI: 0.517-0.997), those with 3 or more diseases ($p = 0.0008$, OR = 0.577, 95% CI: 0.418-0.796), and those with severely impaired IADL ($p = 0.0002$, OR = 0.139, 95% CI: 0.050-0.386) were less likely to have an unmet need for assistive walking devices (Table 2).

Results indicated that the unmet need for assistive walking devices is higher among people who live in community health centers than those live in private

Table 1. Different variables for use of walking aids by the elderly who need them in Shanghai in 2019 [n (%)]

Variables	Needs a walking aid but has not used one (n = 829)	Needs a walking aid and has used one (n = 1,118)	p value
Sex, n (%)			0.4769
Male	347 (41.66%)	486 (58.34%)	
Female	482 (43.27%)	632 (56.73%)	
Age, n (%)			< 0.0001
55–60	23 (60.53%)	15 (39.47%)	
60–69	159 (59.55%)	108 (40.45%)	
70–79	179 (47.86%)	195 (52.14%)	
≥ 80	468 (36.91%)	800 (63.09%)	
Level of education, n (%)			0.0001
Primary School and below	316 (37.98%)	516 (62.02%)	
Junior high school	246 (42.49%)	333 (57.51%)	
Senior high school	163 (52.24%)	149 (47.76%)	
College and above	86 (47.51%)	95 (52.49%)	
Main source of income, n (%)			0.0038
Pension	732 (42.88%)	975 (57.12%)	
Help from relatives and friends	29 (29.90%)	68 (70.10%)	
Some other source	16 (64.00%)	9 (36.00%)	
Residence, n (%)			< 0.0001
Owner-occupied dwelling, private dwelling, etc.	313 (49.37%)	321 (50.63%)	
Rented dwelling	79 (50.97%)	76 (49.03%)	
Old age home or a similar facility	149 (31.43%)	325 (68.57%)	
Nursing home or a similar facility	142 (37.67%)	235 (62.33%)	
Community health service centers	88 (48.89%)	92 (51.11%)	
Hospital or a similar facility	48 (46.60%)	55 (53.40%)	
Language use, n (%)			0.4948
Mandarin	189 (44.68%)	234 (55.32%)	
Dialect	621 (41.73%)	867 (58.27%)	
Mute	5 (50.00%)	5 (50.00%)	
Living alone or cohabitating, n (%)			< 0.0001
Living alone	76 (38.97%)	119 (61.03%)	
Living with spouse	227 (57.32%)	169 (42.68%)	
Living with children	186 (37.58%)	309 (62.42%)	
Other	291 (38.70%)	461 (61.30%)	
Physical care needs of the assessed subjects, n (%)			0.0617
No need	17 (48.57%)	18 (51.43%)	
Care provided by the spouse	57 (41.91%)	79 (58.09%)	
Care provided by children or grandchildren	111 (31.90%)	237 (68.10%)	
Care provided by a professional caregiver	388 (37.34%)	651 (62.66%)	
Elevators in residential floors, n (%)			< 0.0001
Below the 6th floor, without an elevator	327 (47.88%)	356 (52.12%)	
Below the 6th floor, with an elevator	377 (38.91%)	592 (61.09%)	
The 7th floor, without an elevator	6 (46.15%)	7 (53.85%)	
The 7th floor, with an elevator	9 (17.65%)	42 (82.35%)	
The 8th floor and above	101 (48.79%)	106 (51.21%)	
Indoor steps, n (%)			0.2774
Yes	86 (39.27%)	133 (60.73%)	
No	731 (43.13%)	964 (56.87%)	
Indoor handrails, n (%)			0.0576
Yes	348 (40.23%)	517 (59.77%)	
No	469 (44.54%)	584 (55.46%)	
Number of diseases, n (%)			< 0.0001
1	276 (47.26%)	308 (52.74%)	
0	69 (53.49%)	60 (46.51%)	
2	310 (43.97%)	395 (56.03%)	
3 or more	174 (32.89%)	355 (67.11%)	
ADL, n (%)			< 0.0001
Normal	184 (92.93%)	14 (7.07%)	
Very severely impaired	80 (55.94%)	63 (44.06%)	
Severely impaired	205 (38.32%)	330 (61.68%)	
Moderately impaired	322 (32.46%)	670 (67.54%)	
IADL, n (%)			< 0.0001
Self-reliant	149 (89.22%)	18 (10.78%)	
Very severely impaired	361 (36.72%)	622 (63.28%)	
Severely impaired	124 (31.23%)	273 (68.77%)	
Moderately impaired	97 (41.45%)	137 (58.55%)	
Mildly impaired	98 (59.04%)	68 (40.96%)	
Self-rated health status of the elderly, n (%)			< 0.0001
Very good	48 (67.61%)	23 (32.39%)	
Good	88 (55.70%)	70 (44.30%)	
Average	547 (42.11%)	752 (57.89%)	
Bad	131 (33.76%)	257 (66.24%)	
Vary bad	12 (50.00%)	12 (50.00%)	

* p value for differences between elderly who need a walking aid but have not used one and who need a walking aid and have used one.

Table 2. Analysis of factors influencing the unmet need for walking aids for the elderly in Shanghai in 2019 (n = 1,947)

Variables	Single factor p value	OR	95% CI lower limit	95% CI upper limit	Multifactor p values	OR	95% CI lower limit	95% CI upper limit
Sex, male								
Female	0.4773	1.068	0.891	1.281	0.5839	1.075	0.830	1.392
Age, 55-60								
60-69	0.9087	0.96	0.479	1.924	0.6177	0.763	0.264	2.204
70-79	0.14	0.599	0.303	1.183	0.2668	0.557	0.198	1.566
≥ 80	0.0042	0.382**	0.197	0.738	0.4811	0.696	0.253	1.91
Level of education, Primary school and below								
Junior high school	0.0891	1.206	0.972	1.497	0.337	0.861	0.634	1.169
Senior high school	< 0.0001	1.786***	1.374	2.323	0.8282	1.044	0.710	1.533
College and above	0.0179	1.478*	1.07	2.043	0.8054	0.941	0.582	1.522
Main source of income, Pension								
Help from relatives and friends	0.0128	0.568*	0.364	0.887	0.2887	0.760	0.458	1.262
Some other source	0.0399	2.368*	1.041	5.389	0.4037	1.696	0.491	5.858
Residence, Owner-occupied dwelling, private dwelling, etc.								
Rented dwelling	0.7212	1.066	0.750	1.515	0.4904	0.818	0.463	1.447
Old age home or a similar facility	< 0.0001	0.47***	0.367	0.603	0.7152	1.086	0.698	1.689
Nursing home or a similar facility	0.0003	0.62***	0.478	0.804	0.2617	1.305	0.820	2.079
Community health service centers	0.9095	0.981	0.704	1.366	0.0104	1.956*	1.171	3.267
Hospital or a similar facility	0.6024	0.895	0.590	1.358	0.1159	1.652	0.884	3.089
Language use, Mandarin								
Dialect	0.2793	0.887	0.713	1.102	0.4891	1.111	0.824	1.499
Mute	0.7386	1.238	0.353	4.34	0.9942	0.994	0.207	4.779
Living alone or cohabitating, Living alone								
Living with spouse	< 0.0001	2.103***	1.482	2.984	0.0002	2.901***	1.641	5.126
Living with children	0.7332	0.943	0.671	1.325	0.3295	1.309	0.762	2.249
Other	0.9435	0.988	0.716	1.365	0.0258	1.843*	1.076	3.154
Physical care needs of the assessed subjects, No need								
Care provided by the spouse	0.4789	0.764	0.363	1.61	0.0703	0.439	0.180	1.071
Care provided by children and grandchildren	0.0496	0.496*	0.246	0.999	0.2104	0.577	0.244	1.364
Care provided by a professional caregiver	0.1811	0.631	0.321	1.239	0.0944	0.497	0.219	1.128
Elevators in residential floors, Below the 6 th floor, without an elevator								
Below the 6th floor, with an elevator	0.0003	0.693***	0.569	0.845	0.3302	0.827	0.564	1.212
The 7th floor, without an elevator	0.902	0.933	0.310	2.805	0.6022	0.544	0.055	5.376
The 7th floor, with an elevator	0.0001	0.233***	0.112	0.487	0.0084	0.184	0.052	0.648
The 8th floor and above	0.8174	1.037	0.760	1.416	0.8183	1.059	0.649	1.730
Indoor steps, Yes								
No	0.2778	1.173	0.879	1.564	0.749	1.067	0.717	1.588
Indoor handrails, Yes								
No	0.0577	1.193	0.994	1.432	0.0481	0.718*	0.517	0.997
Number of diseases, 1								
0	0.2008	1.283	0.876	0.0427	0.0427	1.684*	1.017	2.788
2	0.2379	0.876	0.703	0.1154	0.1154	0.790	0.590	1.059
3 or more	< 0.0001	0.547***	0.429	0.0008	0.0008	0.577***	0.418	0.796
IADL, Self-reliant								
Very severely impaired	< 0.0001	0.07***	0.042	0.0003	0.0003	0.153***	0.055	0.426
Severely impaired	< 0.0001	0.055***	0.032	0.0002	0.0002	0.139***	0.050	0.386
Moderately impaired	< 0.0001	0.086***	0.049	0.0077	0.0077	0.247**	0.089	0.691
Mildly impaired	< 0.0001	0.174***	0.098	0.0369	0.0369	0.318*	0.108	0.933
Self-rated health status of the elderly, Very good								
Good	0.0911	0.602	0.335	0.3073	0.3073	0.637	0.268	1.515
Average	< 0.0001	0.349	0.209	0.345	0.345	0.703	0.339	1.461
Bad	< 0.0001	0.244	0.142	0.2193	0.2193	0.615	0.283	1.335
Very bad	0.1258	0.479	0.187	0.555	0.555	1.431	0.435	4.701

*indicates $p < 0.05$, **indicates $p < 0.01$, ***indicates $p < 0.001$.

dwellings. A previous study indicated that 78% of elderly adults receiving community-based home care in Beijing used assistive devices (15), and that figure is quite high. However, little attention has been paid to research on the need for and utilization of assistive devices among people who live in community health centers.

The current results indicated that the unmet need

for assistive walking devices was higher among people living only with their spouses than among those living alone, which is consistent with previous studies. The use of assistive walking devices was lowest among married people and highest among widowed ones. Being married was negatively associated with the use of aids, while living alone was positively associated with their use

(3,16-19). This is possibly because the spouse plays the role of caregiver.

Self-perceived needs of the elderly, the diversity and performance of assistive devices, and the accessibility and affordability of assistive walking devices may lead to unmet needs

There may be various reasons why assistive walking devices needs were unmet, such as lack of self-awareness of one's need on the part of the elderly and a lack of diversity and poor performance of assistive devices and poor accessibility and affordability on the part of manufacturers.

First, the low level of self-perceived need and the lack of confidence in the diversity and performance of assistive devices may lead to their underutilization. On the one hand, the elderly had insufficient self-awareness of their need for assistive devices. On the other hand, only 37.6% of the elderly agreed that "assistive devices are of significant help to the safety and health of the elderly" (13).

Therefore, the lack of diversity and poor performance of assistive devices may also lead to their underutilization. On the one hand, aids are not sufficiently diverse. Most of the domestic assistive devices for the elderly are imitations of foreign products, with considerable homogeneity, few varieties, low quality, limited brand recognition, and a small high-end market. On the other hand, the performance of assistive devices is not fully guaranteed. The quality and performance of domestic accessories for the elderly need to be improved, and the reliability of middle and low-end products should be fully guaranteed (20).

In addition, the accessibility of assistive devices needs to be further improved, since this a key reason for their underutilization. On the one hand, there are not enough personnel in the evaluation stage. At present, there is a shortage of qualified personnel to evaluate suitable aids for the elderly in China. On the other hand, there is excessive marketing and a domestic emphasis in the product supply stage, and a mature service delivery mechanism has not yet to be created (20,21).

Last but not least, the affordability of assistive devices needs to be further improved, since this is another key reason for their underutilization. At present, insurance does not cover assistive devices for the elderly in China, and they need to be paid for by individuals. Some elderly people with an unstable financial situation cannot afford expensive assistive devices (20).

In conclusion, the following efforts need to be made to improve the utilization of assistive devices for the elderly: the self-awareness of need must be heightened among the elderly, the elderly need to be informed and educated about assistive devices, the diversity and performance of assistive devices needs to be enhanced,

and the accessibility and affordability of those devices needs to be enhanced.

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References

1. National Bureau of Statistics. Data from the seventh National Census. <https://data.stats.gov.cn/easyquery.htm?cn=C01&zb=A0305&sj=2020> (accessed November 15, 2022). (in Chinese)
2. Wang CY, Li F, Wang LN, Zhou WT, Zhu BF, Zhang XX, Ding LL, He ZM, Song PP, Jin CL. The impact of population aging on medical expenses: A big data study based on the life table. *Biosci Trends*. 2018; 11:619-631.
3. Ishigami Y, Jutai J, Kirkland S. Assistive device use among community-dwelling older adults: A profile of Canadians using hearing, vision, and mobility devices in the Canadian longitudinal study on aging. *Can J Aging*. 2021; 40:23-38.
4. Development Research Center, State Council. Healthy aging: Driven by policy and industrial development. China Development Press, China, Beijing, 2019. (in Chinese)
5. Niu YH, Li N, Jin CL, Chen D, Yang YT, Ding HS. Activity outside the home, environmental barriers, and healthy aging for community-dwelling elderly individuals in China. *Biosci Trends*. 2017; 11:603-605.
6. West BA, Bhat G, Stevens J, Bergen G. Assistive device use and mobility-related factors among adults aged \geq 65 years. *J Safety Res*. 2015; 55:147-150.
7. The Social Welfare Department. 108 Annual Assistive Services Aggregation Analysis Report. 2020. <https://newrepat.sfaa.gov.tw/home/download?conditions%5bcategory.id%5d=2c90e4c76705ab7f01671535b6e40d29> (accessed August 31, 2022). (in Chinese)
8. Peterson LJ, Meng H, Dobbs D, Hyer K. Gender differences in mobility device use among U.S. older adults. *J Gerontol B Psychol Sci Soc Sci*. 2017; 72:827-835.
9. Zhang X, Chen G. Use and needs of assistive devices in the background of aging: Current situation and research progress. *Zhongguo Kangfu Lilun Yu Shijian*. 2016; 22:1350-1353. (in Chinese)
10. Zhang WJ, Tan WJ. An analysis on using behavior of assistive devices of Chinese elderly. *Population & Development*. 2016; 22:100-112+70. (in Chinese)
11. Jiang MD, Dai FM, Xu JJ, Jia WW, Li D, Liu SY. Current status of mobility devices usage in the elderly and influencing factors. *J Nursing Science*. 2019; 34:23-27. (in

- Chinese)
12. Gao JM, Zheng XY. Use of hearing aids and assistive listening devices and its influencing factors among the elderly with disabling hearing loss in China. *Chin J Public Health*. 2021; 37:1261-1266. (in Chinese)
 13. Yu S, Luo D, Zhu Y, Yang L, Li H, Luo J, Gu K, Wu D, Zhao Q, Bai D, Xiao M. Factors influencing utilisation of assistive devices by the elderly in China: A community-based cross-sectional study. *Public Health*. 2022; 213:12-18.
 14. Zhu XC, Wan WJ, Li Y, Chen XH. Analysis of the current status and factors influencing the use of mobile assistive devices by disabled elderly in pension institutions in Shanghai. *Modern Nurse*. 2022; 29:104-107. (in Chinese)
 15. Lai Q, Ouyang Q, Tu QL, Long H, Zhang XL. Survey on assistive devices utilization for old adults supported by community-based homecare in Dongcheng, Beijing. *Chin J Rehabil Theory Pract*. 2019; 25:234-238. (in Chinese)
 16. Agree EM, Freedman VA, Sengupta M. Factors influencing the use of mobility technology in community-based long-term care. *J Aging Health*. 2004; 16:267-307.
 17. Agree EM, Freedman VA, Cornman JC, Wolf DA, Marcotte JE. Reconsidering substitution in long-term care: When does assistive technology take the place of personal care? *J Gerontol B Psychol Sci Soc Sci*. 2005; 60:S272-S280.
 18. Pressler KA, Ferraro KF. Assistive device use as a dynamic acquisition process in later life. *Gerontologist*. 2010; 50:371-381.
 19. Tomita MR, Mann WC, Fraas LF, Stanton KM. Predictors of the use of assistive devices that address physical impairments among community-based frail elders. *Journal of Applied Gerontology*. 2004; 23:141-155.
 20. Luo YM. An examination of the establishment of a national system of assistive aids for the elderly. *Standard Science*. 2018; 3:61-65. (in Chinese)
 21. Wei CJ, Li GF. Status of and suggestions for a welfare policy on assistive technology in China. *Social Welfare*. 2021; 05:3-6. (in Chinese)

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