

An analysis of the current demand of senior citizens in underdeveloped areas of Western China for the combination of medical and elderly care and the corresponding influencing factors: a case study of Lanzhou

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Abstract

Background: This study aims to understand the current demand of senior citizens in Lanzhou, China for the combination of medical and elderly care services and discuss its influencing factors.

Methods: 7500 participants aged 60 or above living in Lanzhou, China were recruited, A uniform and self-designed questionnaire survey was conducted on these subjects. Then, two methods, namely, single factor chi-square test and multi-factor binomial logistic regression were used to analyze.

Results: Among 7,320 senior citizens, 3,772 have demand for the combination of medical and elderly care with a demand rate of 53.15%. The differences between genders, marital status, education background, occupation before retirement, number of children, monthly income, self-assessment of health, type of endowment insurance, type of medical insurance, current elderly care model, elderly care demand, self-care ability, awareness of the combination of medical and elderly care and willingness to pay for the combination of medical and elderly care and the demand of senior citizens in Lanzhou for the combination of medical and elderly care are all of statistical significance ($P \leq 0.05$), while the differences between age, mode of living and chronic diseases and the demand of senior citizens in Lanzhou for the combination of medical and elderly care are all of no statistical significance ($P > 0.05$).

Conclusions: The factors that influence the demand for the combination of medical and elderly care by senior citizens in Lanzhou are complicated, among which, the number of children, type of medical insurance and willingness to pay for the combination of medical and elderly care are main factors that influence their demand. The awareness of and the demand for the combination of medical and elderly care among senior citizens in Lanzhou are at a low level, and the number of children, type of medical insurance and willingness to pay for the combination of medical and elderly care have great influence on the demand rate.

Background

In recent years, the aging of population is becoming increasingly prominent in China. According to the latest demographic data about senior citizens published by the National Bureau of Statistics, there were around 240.9 million people aged 60 or above in China in 2017, accounting for 17.30% of the total population, 158.31 million of which were 65 or above, taking up 11.40% of the total population. Although aging problem has not existed for a long time in China in comparison with many countries and regions in the world such as Japan and Europe, medical care and elderly care for the aged have received wide attention with the deepening of the aging issue in China, therefore, how to ensure the quality of life of the aged has become a primary social problem[1–4]. With the weakening of the functions of traditional in-home elderly care model of China, elderly care models like institution-based elderly care and community-based elderly care are hard to satisfy the medical and health care needs of senior citizens, therefore, China formally put forward the model of integrative development of medical and elderly care in 2013. The combination of medical and elderly care is a kind of elderly care model which integrates medical

treatment, nursing, rehabilitation, basic facilities for elderly care, daily care and accessibility activities. Its advantage lies in that it can prevent the separation between general medical care and elderly care, provide senior citizens with timely, convenient and accurate medical services, and finally offer integrated services from medical service, daily care and rehabilitation to hospice care, thus satisfying the overall elderly care demand of senior citizens. As of the end of 2017, there had been 474,000 senior citizens aged 65 or above in Lanzhou, a typical economically underdeveloped city in western China, accounting for 12.70% of the total population of the city, and the proportion of senior citizens aged 65 or above was obviously higher than the national average and the provincial average of Gansu Province (see Fig.1), showing prominent aging of population and increasingly heavier burden of providing elderly care. In addition, elderly care problem in Lanzhou is special and complicated, which is primarily manifested by the dialectical relationships between elderly care demand, supply and the ability to pay for it. On the one hand, the combination of medical and elderly care services is highly under supplied; on the other hand, there is a gap between senior citizens' financial ability to pay and their elderly care demand. Therefore, to develop the combination of medical and elderly care in underdeveloped areas of Western China, we must understand the current situation of the combination of medical and elderly care services in these areas and its influencing factors. Thus, through questionnaire survey about the demand of the residents in Lanzhou for the combination of medical and elderly care services, this article analyzed specific needs of these citizens for these services and the factors that influence their demand for these services, and then put forward relevant policy suggestions, with a view to improving the health level of residents in Lanzhou, satisfying their demand for medical and elderly care and improving eldercare services for the citizens.

Methods

2.1 Participants

Through stratified random sampling, related questionnaires were administered in four districts of Lanzhou (Chengguan District, Qilihe District, Anning District and Xigu District; see Fig.2 for the location diagram of the study areas[5], Fig.2 redraw according to reference 5) and senior citizens aged 60 or above were selected as the respondents. 7,500 senior citizens were surveyed and given the questionnaires about the combination of medical and elderly care. Selection criteria: ≥ 60 years of age; ≥ 6 months of residence; normal cognitive ability and responsiveness; informed consent. 7,500 questionnaires in total were administered this time, and 7,320 valid ones were collected.

2.2 Design and procedure

Questionnaire about the demand for the combination of medical and elderly care: Based on full consideration of pertinent literature and national health policies, the questionnaire was designed by epidemiologists and statisticians, with the research team and elderly care management experts jointly involved in to formulate the questionnaire about the demand for the combination of medical and elderly care. Before the formal questionnaires were administered, convenience sampling was used to select 100 retired residents for pre-survey. The questionnaire was revised according to pre-survey results before

forming the formal one. Socio-demographic factors, physical condition, elderly care model and demand for the combination of medical and elderly care were all contained in the questionnaire.

2.3 Quality control method

Face-to-face survey of the senior citizens was conducted by trained researchers. The researchers explained it to them when administering questionnaires, for senior citizens might not have clear cognition about the combination of medical and elderly care. Moreover, the questionnaires were collected and reviewed by specialists who would fill up missing items or correct errors (if any).

2.4 Statistical analyses

Software Epidata3.1 was used to log and proofread data in duplicate. Statistical software SPSS 18.0 was used statistical treatment. Enumeration data used χ^2 test, and the influencing factors were analyzed with binomial logistic regression. Statistical significance in the differences would be confirmed in case of $P \leq 0.05$.

Results

3.1 General situation of senior citizens in Lanzhou

The respondents were retired senior citizens aged over 60. Among them, 3,059 were male, accounting for 41.79% of the total number of the respondents, and 4,261 were female, taking up 58.41%; those who aged 60–70 account for 16.2%, those who aged 71–80 take up 39.6%, and the citizens more than 80 years old take up 26.4%; 404 (5.52%) of them are primary school graduates, 1,437(19.63%) are junior high school graduates, 2,560 (34.97%) are senior high school or technical secondary school graduates, 2,380(32.51%) are junior college graduates, and 539(7.35%) are undergraduate college graduates or above; those senior citizens who have one child account for 14.51%, those who have two children take up 29.59%, and those who have three children or more occupy 55.90%; those who live alone account for 37.16%, and 5,902 respondents follows other modes of living (62.84%), see Table1.

3.2 Cognition of and demand for the combination of medical and elderly care by senior citizens in Lanzhou

Among 7,320 senior citizens surveyed, 62.43% of them had never heard about the combination of medical and elderly care model before, 29.44% had heard about it but did not know it well, and only 7.61% have a basic knowledge of it. Only 38 senior citizens surveyed knew well about it, accounting for 0.51%. Meanwhile, among the 7,320 senior citizens surveyed, 3,772 need the combination of medical and elderly care, accounting for 51.53%. Among those senior citizens who have demand for the combination of

medical and elderly care, 41.75% of them hope to have an access to daily care the most among related services, and nearly half of them hope related service providers can offer them healthcare services which integrate disease prevention, health care, medical treatment and rehabilitation.

3.3 Single factor analysis of the influencing factors on the demand of senior citizens in Lanzhou for the combination of medical and elderly care

It was found by analysis that the differences between genders, marital status, education background, occupation before retirement, number of children, monthly income, self-assessment of health, type of endowment insurance, type of medical insurance, current elderly care model, elderly care demand, self-care ability, awareness of the combination of medical and elderly care and willingness to pay for the combination of medical and elderly care and the demand for the combination of medical and elderly care by senior citizens in Lanzhou are all of statistical significance ($P \leq 0.05$), while the differences between those with age, mode of living, chronic disease and the demand of senior citizens in Lanzhou for the combination of medical and elderly care are all of no statistical significance ($P > 0.05$), see Table 1.

3.4 Logistic regression analysis of the influencing factors on the demand of senior citizens in Lanzhou for the combination of medical and elderly care

The factors with statistical significance in single factor analysis (gender, marital status, level of education, occupation before retirement, number of children, monthly income, self-assessment of health, type of endowment insurance, type of medical insurance, current elderly care model, elderly care demand, self-care ability, awareness of the combination of medical and elderly care and willingness to pay for it) were taken as independent variables, and the demand for the combination of medical and elderly care services among senior citizens was taken as the dependent variable to carry out binomial logistic regression analysis. $P \leq 0.05$ was taken as the significance level. Results show that the number of children, self-assessment of health, type of medical insurance, current elderly care model, elderly care demand, self-care ability, awareness of the combination of medical and elderly care and willingness to pay for the combination of medical and elderly care are factors that influence the demand for the combination of medical and elderly care by senior citizens ($P \leq 0.05$, see Table 2)

Discussion

4.1 Comparison between the cognition and demand of senior citizens for the combination of medical and elderly care services

The survey data of this study show that only 8.12% of the 7,320 senior citizens aged over 60 in Lanzhou are aware of and understand the combination of medical and elderly care. In Yinchuan, a study conducted by Hu Qi et al. indicated that only 7.6% of the residents had a basic knowledge of the combination of medical and elderly care, and 0.5% knew well about it [3]. A study conducted by Zhou Yan et al. in Urumqi shows that 13.67% of residents said they had heard of or had a basic knowledge of the combination of medical and elderly care [4]. The findings of a study made by Wang Shuangyan et al. in Changchun showed that 2.54% of senior citizens in communities knew well about it, and 6.21% knew a thing or two about it [6]. A study conducted by Liu Wei et al. in Karamay found that only 11.30% of local residents knew and comprehended the elderly care model of the combination of medical and elderly care [7]. Results of this study are basically consistent with the above-mentioned results, which indicates that people's awareness of the combination of medical and elderly care services is at a low level at present.

Since the combination of medical and elderly care in China is still at the stage of exploration, most related studies focus on theories, problems and countermeasures, and there are only a few empirical investigations about the demand rate for combination of medical and elderly care. This survey shows that the demand rate for the combination of medical and elderly care among senior citizens in Lanzhou is 51.43%. Some domestic studies also reported the demand of senior citizens for the combination of medical and elderly care services, for examples, 61.9% of retired citizens in Tianjin need the combination of medical and elderly care, 50.08% of senior citizens in the urban area of Yinchuan need it [1], 53.00% of senior citizens in Chongqing demand it [2], 56.21% of senior citizens in Changchun demand the elderly care model of the combination of medical and elderly care [6], the demand rate in Karamay is 53.01% [7], the demand rate among senior citizens in the urban area of Zhanjiang is 54.60% [8], while elderly patients in Weifang have robust demand for the combination of medical and elderly care services with a demand rate of 97.40% [9]. Meanwhile, 61.10% of empty-nesters in communities in Quanzhou need the combination of medical and elderly care services [10], and 43.40% of senior citizens in Qiqihar have demand for the combination of medical and elderly care [11]. Compared with the above studies, the demand rate for the combination of medical and elderly care by senior citizens in Lanzhou is at a relatively low level.

4. 2 Influencing factors on the demand for the combination of medical and elderly care by senior citizens in Lanzhou

4.2.1 The willingness to pay for the combination of medical and elderly care

49.64% of senior citizens are willing to pay 2,000 to 3,000 yuan every month for the combination of medical and elderly care services, 64.50% are willing to pay more than 3,000 yuan a month for these services, 36.54% are willing to pay no more than 1,000 yuan for these services per month. Moreover, the

demand for the combination of medical and elderly care of the respondents increases, for they are willing to pay more, which is probably because those senior citizens who are more willing to pay are superior to those whose are less willing to pay in terms of social status, economic income, education background and other conditions.

4.2.2 Type of medical insurance

In this study, the type of medical insurance is a factor that influences the demand rate of the combination of medical and elderly care among senior citizens. Those senior citizens who have urban medical insurance have increased demand for the combination of medical and elderly care. The cost of institution-based elderly care is normally higher than that of in-home elderly care, and urban medical insurance enjoys a high proportion of reimbursement. Although many elderly care pay items are not included in the scope of reimbursement, expenses arising from medical treatment in the combination of medical and elderly care can be reimbursed by a stipulated ratio, which reduces a considerable portion cost of the combination of medical and elderly care, so senior citizens who have urban medical insurance are more willing to choose an institution offering the combination of medical and elderly care services.

4. 2.3 Number of children

The results of this study show that the number of children is a factor influencing the demand rate of the combination of medical and elderly care among senior citizens. Senior citizens who have fewer children have higher demand for the combination of medical and elderly care. This is probably because their children are willing yet unable to offer daily care to their aged parents due to the increase of nuclear families and empty-nest families increase. However, generally speaking, the more children a senior citizen has, the more abundant the in-home elderly care resources and the more secure the in-home elderly care will be. As a result, the demand for the combination of medical and elderly care will be low. As a nuclear family is formed, the number of senior citizens in need of support and care in a single family will increase correspondingly, while family members who take care of them will decrease and be unable to take meticulous care of them, especially incapable of meeting special needs of senior citizens with physical disability, chronic diseases, high-incidence disease or terminal illness, such as medical treatment, nursing, rehabilitation and hospice care. Therefore, since some senior citizens have fewer children or their children do not live with them, they may lack daily care and find it inconvenient to go to hospital. In this way, they have higher demand for the combination of medical and elderly care.

4. 2.4 Level of awareness of the combination of medical and elderly care

The level of awareness of the combination of medical and elderly care is a factor influencing the demand for the combination of medical and elderly care. Compared with senior citizens who have no

understanding of the elderly care model of the combination of medical and elderly care, those who understand this model are more willing to join in this model. For senior citizens, the combination of medical and elderly care is a new elderly care model, and the more senior citizens know about it and its advantages, the more they are willing to choose an institution offering the combination of medical and elderly care services. This shows that the growth of this model is significantly correlated with the understanding and cognition of residents, so relevant government departments should publicize it properly to raise the awareness and recognition of this model among the masses as soon as possible.

4. 2.5 Self-assessment of health

The results of this study show that self-assessment of health is a factor influencing the demand rate for the combination of medical and elderly care among senior citizens. Senior citizens who have poor self-assessment of health tend to have higher demand for the combination of medical and elderly care, which is consistent with related research results[2–11]. As senior citizens' body functions deteriorate, their physical condition becomes worse and worse and they are more disease-prone than other age groups, thus, their demand for health care accessibility will increase day by day. Therefore, they pay more attention to the combination of medical and elderly care services, hoping to be able to acquire medical services timely and conveniently. Senior citizens who have poor self-assessment of health are inclined to have this demand obviously, so they need the combination of medical and elderly care services more.

4.2.6 Current elderly care model

Results of this study show that the current elderly care model is a factor that influences the demand rate for the combination of medical and elderly care among senior citizens. Due to the influence of self-assessment of health, time and energy of children, local cultural habit, economic factor and psychological need, most senior citizens choose in-home elderly care as their ideal elderly care model. However, owing to financial difficulty, unattended daily life, poor health and disease, the absence of entertainment, loneliness and boredom and even other reasons, 42.13% of senior citizens believe that there is a gap between the present elderly care model and the ideal elderly care model[3]. However, the combination of medical and elderly care, as a high-quality elderly care model which puts health and medical services for senior citizens in a more important position and is differentiated from traditional elderly care services, is a high-quality elderly care service model that simply provides senior citizens with elderly care services meeting basic daily living needs, which holds some appeal to these senior citizens.

4.3 Comparison between primary influencing factors on the demand of senior citizens in different areas for the combination of medical and elderly care

Fig.3 shows that primary factors influencing the demand for the combination of medical and elderly care by senior citizens vary from place to place. Specifically, in Lanzhou, the willingness to pay for the combination of medical and elderly care is the primary factor that influences the demand for the combination of medical and elderly care of senior citizens; in Zhanjiang[8],the type of medical insurance is the chief influencing factor; in Quanzhou [10], health management plays an important role in the demand for the combination of medical and elderly care of local senior citizens; in Chongqing [2],children’s support for the combination of medical and elderly care is a determinant of the demand rate; in Shihezi[12],income and age have a greater influence on the demand for the combination of medical and elderly care of senior citizens. The above results show that related departments must formulate development plans and policies regarding the combination of medical and elderly care in accordance with local conditions.

Conclusions

The cognition of and the demand for the combination of medical and elderly care by senior citizens in Lanzhou are still at a low level. The factors that influence such demand are complicated, and number of children, type of medical insurance and the willingness to pay for the combination of medical and elderly care are the main factors that influence the demand. Relevant departments in Lanzhou should improve related laws and regulations and introduce systems and standards according to local conditions, while intensifying the publicity for the combination of medical and elderly care and increasing the demand. Besides, it is necessary to accelerate the establishment of institutions featuring the combination of medical and elderly care and ensure the ability to supply the combination of medical and elderly care.

Declarations

Abbreviations

Not applicable

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fees of open access publishing. The funding bodies had no role in the design of the study; collection, analysis, interpretation of data; and in writing the manuscript.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

GXB, TKG, and HC conceived and designed the study. YHW, JXZ, and BP performed the data collection. YHW and BP managed the data and performed the analysis. YHW and BP were responsible for data analysis and interpretation. JCW and YHW wrote the initial draft of the paper. HC critically reviewed, revised and supplemented the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

The study has been approved by the Ethics Committee of the Gansu Provincial Hospital. This article does not report an individual participant's data. Trained interviewers at respondents' homes and local community health service centers conducted face-to-face interviews with older adults' written informed consent.

Competing interests

The authors declare that they have no competing interests.

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Tables

Table 1 Single factor analysis on influencing factors for medical-nursing combined service demand among elders

Independent variable	Number	Demand rate	Chi-square	<i>P</i>
Gender				
Male	3059	1749(57.18)	6.67	0.000
Female	4261	2023(47.48)		
Age(years)				
60-70	5682	2814(49.52)	3.635	0.162
71-80	1584	923(58.27)		
≥80	84	35(41.67)		
Marital status				
Married	5812	2913(50.12)	9.46	0.000
Unmarried	81	10(12.35)		
Divorced or widowed	1427	84(5.89)		
Education				
Elementary school and below	404	183(45.3)	12.54	0.000
Junior high school	1437	757(52.68)		
Senior high school or technical secondary school	2560	1217(47.54)		
Junior college	2380	1265(53.15)		
Bachelor degree or above	539	350(64.94)		
Pre-retirement occupation				
State functionary	472	294(62.29)	43.50	0.000
Public institution personnel	1437	946(65.83)		
Enterprise staffs	2403	1123(46.73)		
Other	3008	1409(46.84)		
Number of children				
0	0			
1	1062	799(75.24)	33.20	0.000
2	2166	1237(57.11)		
≥3	4092	1736(42.42)		
Living arrangement				
Not alone	5902	3079(52.17)	4.708	0.079
Alone	1418	693(48.87)		
Income per month(RMB)				
≤2000	1338	593(44.32)	17.85	0.000
2000-4000	2378	1207(50.76)		
4000-6000	2192	1142(52.10)		
≥6000	1412	830(58.78)		
Self-rated health				
Good	3388	1771(52.27)	31.027	0.000
Fair	3268	1725(52.78)		
Poor	664	276(41.57)		
Have chronic diseases				
Yes	3694	1955(52.92)	1.395	0.901
No	3626	1817(50.11)		
Type of endowment insurance				
Endowment insurance for urban workers	3791	1992(52.55)	29.87	0.000
Endowment insurance for urban and rural residents	2378	1142(48.02)		
Enterprise annuity	334	223(66.77)		
Commercial insurance	111	50(45.05)		
Not have	706	335(47.45)		
Type of medical insurance				
Medical insurance for urban workers	1817	958(52.72)	37.18	0.000
Medical insurance for urban and rural residents	3930	2065(52.54)		
Commercial insurance	590	477(80.85)		
Not have	983	272(27.67)		
The current way of old-age care				
Family endowment	6465	3177(49.14)	38.20	0.000
Community endowment	632	446(70.57)		
Institution endowment	223	149(66.82)		
Other	0			
Demand of the elderly				
Medical care	1806	1101(60.96)	57.81	0.000
Assisted living	3733	1575(42.19)		
Mental care	220	122(55.45)		
Leisure and entertainment	1561	974(62.4)		
Self-care ability				
Have self-care ability	5231	2041(39.02)	43.38	0.000
Need help from others	1890	1572(83.17)		

Continue to table 1

No self-care ability	199	159(79.9)		
Knowledge of the combination with medical care				
Never heard	4570	2093(45.8)		
Heard but not understood	2155	1304(60.51)	56.41	0.000
Have gained some understanding	557	369(66.25)		
Know well	38	6(15.79)		
Willingness to pay in combination with medical care per month(RMB)				
≤1000	1040	380(36.54)		
1000-2000	1561	674(43.18)	69.64	0.000
2000-3000	2192	1088(49.64)		
≥3000	2527	1630(64.5)		

Table 2 Logistic regression analysis of influencing factors for medical-nursing combined service demand among elders

Independent variable	β	SE	P	OR	95%C.I.for OR	
					Lower	Upper
Gender	0.62	0.15	0.00	1.25	0.95	2.32
Marital status	0.27	0.14	0.09	0.93	0.59	1.47
Education	0.34	0.08	0.15	1.17	0.92	2.49
Pre-retirement occupation	0.14	0.09	0.00	1.15	0.90	1.26
Number of children	0.50	0.13	0.00	1.39	1.03	2.15
Income per month(RMB)	0.25	0.17	0.19	1.21	0.87	1.91
Self-rated health	-0.46	0.12	0.00	0.67	0.52	0.83
Type of endowment insurance	-0.12	0.11	0.43	0.93	0.67	1.23
Type of medical insurance	0.59	0.22	0.00	1.65	1.23	2.45
The current way of old-age care	-0.43	0.18	0.01	0.61	0.42	0.91
Demand of the elderly	-0.63	0.17	0.00	0.53	0.37	0.72
Self-care ability	-1.23	0.28	0.00	0.34	0.12	0.65
Knowledge of the combination with medical care	-0.59	0.32	0.00	0.71	0.39	0.83
Willingness to pay in combination	0.90	0.34	0.00	1.94	1.17	2.64

Figures

Lanzhou is regarded as entering an aging society according to the UN's standard that an area's old people over 65 years old takes up 7% of the total population.

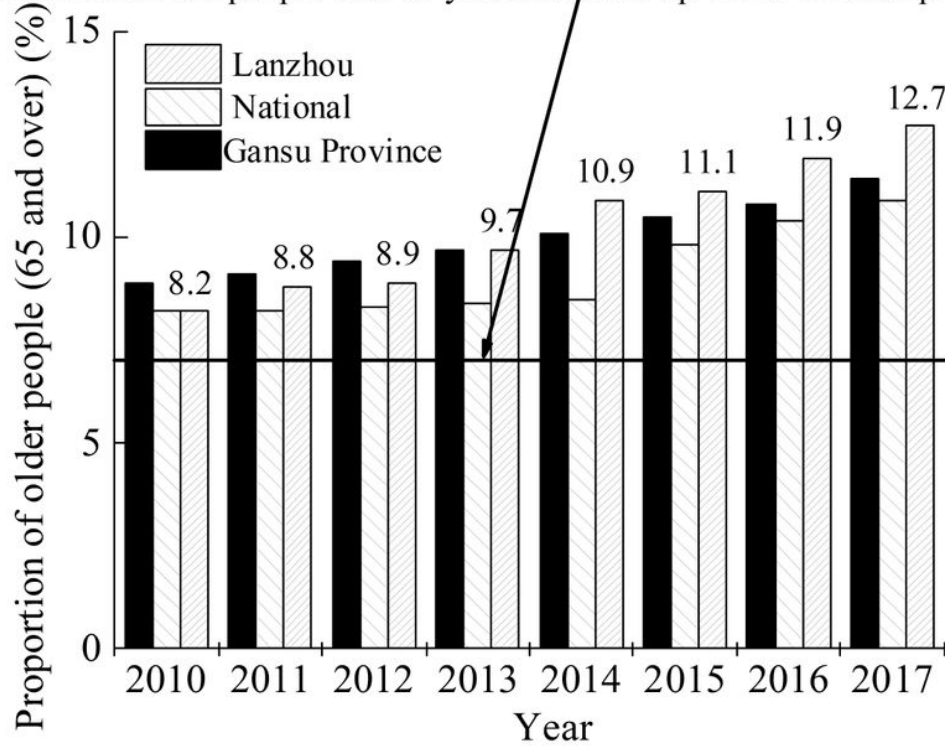


Figure 1

Population aging trend in Lanzhou city from 2010 to 2017

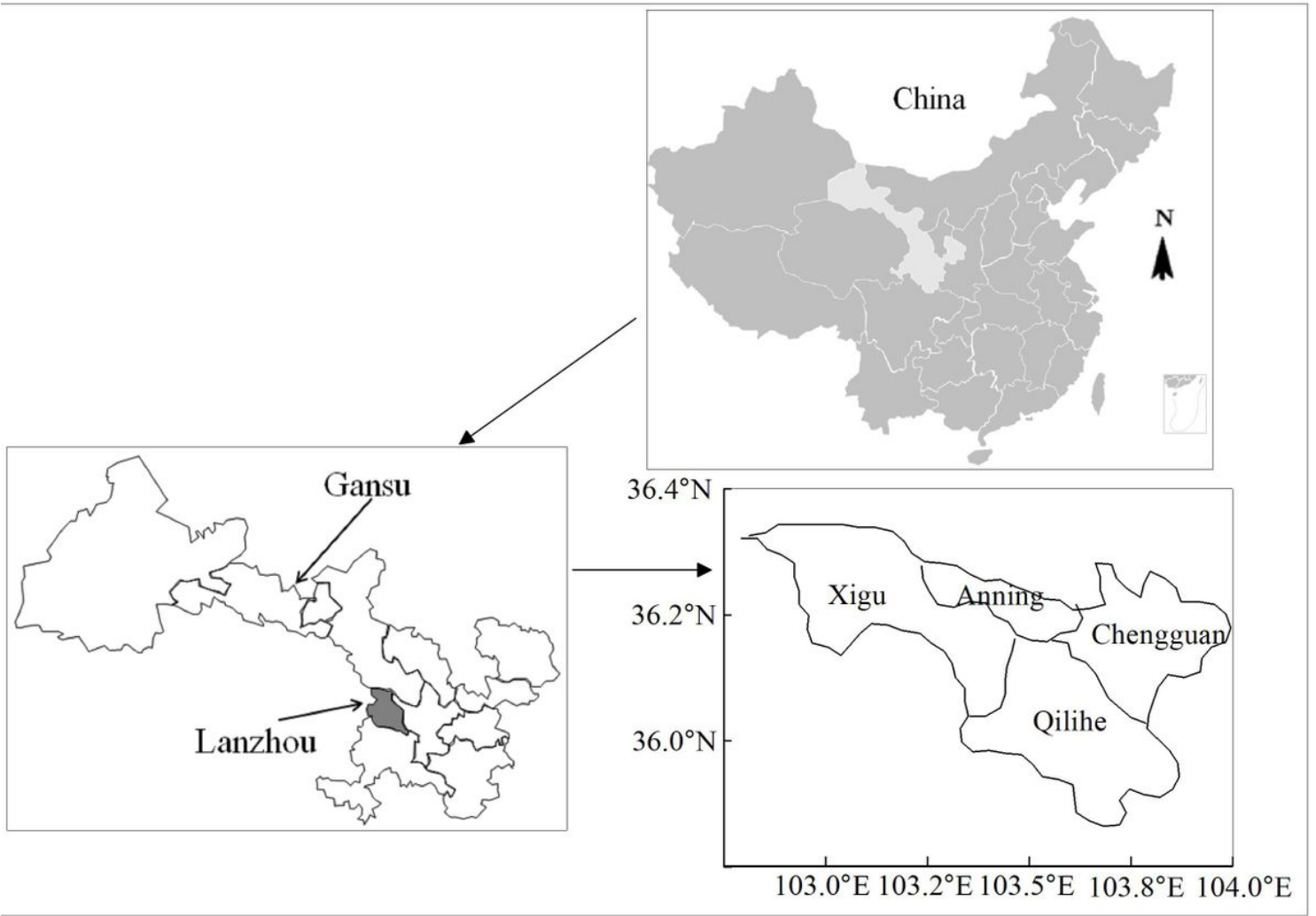


Figure 2

The geographical location of the study area in China Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.

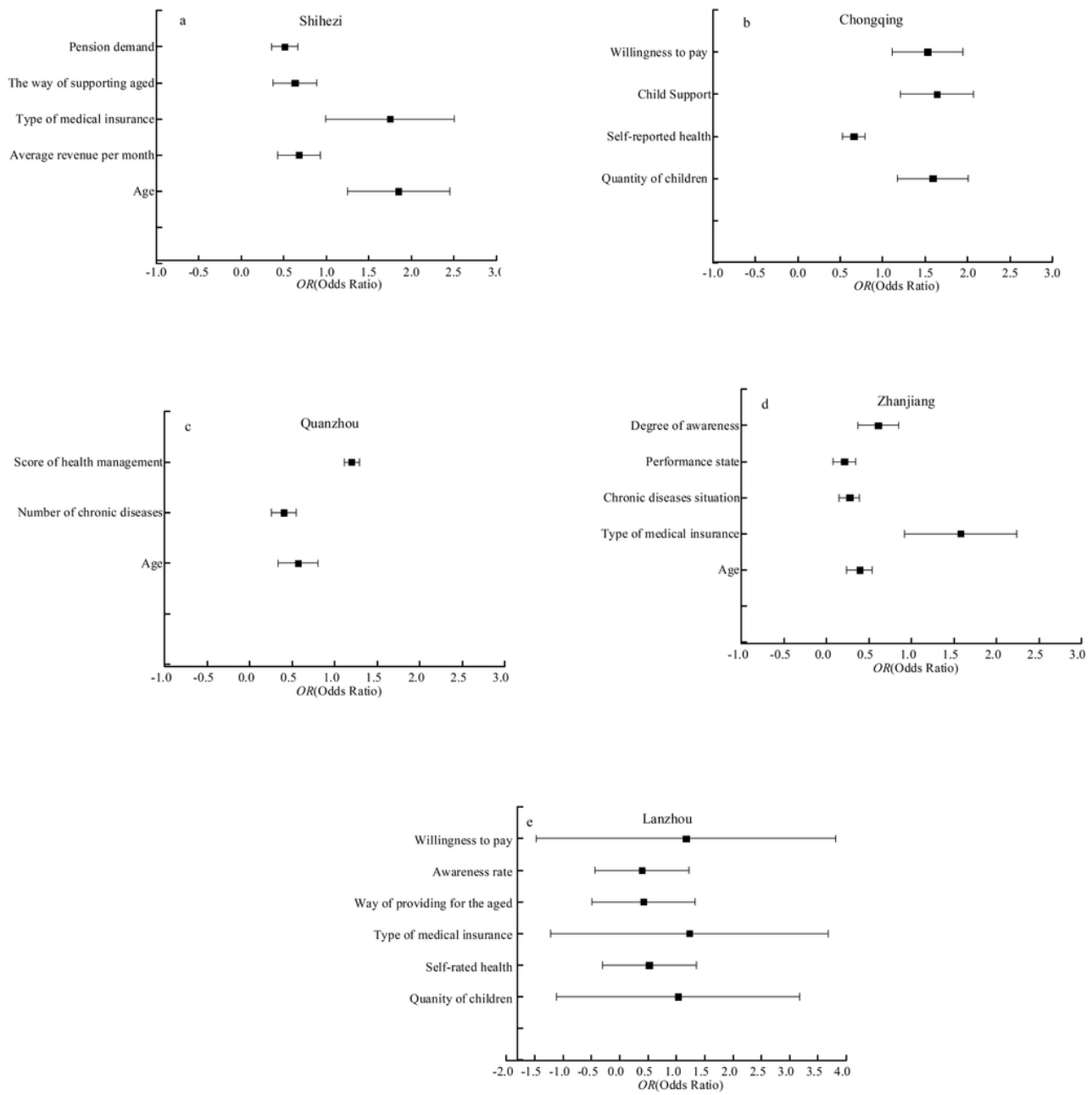


Figure 3

Comparison of the primary influencing factors for the needs of the elderly in different areas