

# BMJ Open Analysis on the willingness and influencing factors of choosing hospice care service institutions among among older people in Wuhu, China: a cross-sectional study

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## ABSTRACT

**Objective** The purpose of this study was to evaluate the inclination and determinants influencing the selection of hospice care service institutions among elderly individuals in China.

**Design** The study conducted has a cross-sectional design.

**Setting** The study was conducted at four urban community centres in Wuhu, Anhui Province, China.

**Participants** The sample consisted of 642 older adults, with ages ranging from 60 to over (mean age=71.03 years, SD=7.18).

**Method** This study, based on the Anderson model, developed a questionnaire after conducting a preliminary survey and engaging in several group discussions. The final questionnaire encompassed the basic information, health status, attitude towards hospice care, choice of hospice care institutions and reasons of the older people. A regional population study was conducted using the Logistic regression model to estimate the ORs (OR) of influencing factors selected by hospice services.

**Results** 38.5% of respondents expressed their willingness to receive hospice care, while 22.3% were unwilling and 39.3% felt ambivalent towards it. The acceptance rate of older people in hospice care increases with higher levels of education and monthly income. 47.0% of older people opted for hospice care in a general hospital ward, indicating that demand for hospice services among older people in Wuhu City is primarily focused on such wards. The univariate analysis revealed significant differences in the willingness of older individuals to accept hospice care services based on gender, age, educational attainment and income levels. Regardless of the location of hospice care, older men had a lower likelihood of being willing to use hospice services compared with older women. The proportion of older women choosing a hospice ward or general hospital was 53.8%, which was higher than that of older men at 42.0%. The proportion of older men choosing a community health service institution was 31.6%, higher than 23.3% of women. The educational level differences significantly influence the older people's inclination towards receiving hospice care.

**Conclusion** With the ageing population of Wuhu City on the rise, there is an increasing demand for hospice services. In their final journey, older individuals require

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study employed face-to-face data collection methods as a means to mitigate potential biases associated with online surveying, thereby ensuring a more rigorous and academically sound approach in line.
- ⇒ This study used the Anderson behavioural model as a theoretical framework to evaluate the desire and determinants that influence the selection of hospice facilities among the elderly population in China.
- ⇒ The study relies on self-reported outcomes, which may introduce measurement bias.
- ⇒ This was not a multicentre study not representative of a pan-global population.

multilevel hospice care services, which necessitates equipping general hospitals with hospice wards and using community health service centres to meet their specific needs.

## INTRODUCTION

China is experiencing one of the most rapid rates of population ageing globally. Recently, policy-makers at a high level have acknowledged that this demographic shift poses significant challenges to the healthcare system in China.<sup>1</sup> With a rapidly increasing number of older people citizens living longer than ever before, this demographic shift will undoubtedly bring about a host of complex issues related to social security, medical services, long-term care facilities and infrastructure. One of the major challenges posed by this demographic shift is the increased prevalence of chronic diseases among older adults. Conditions such as cancer and other incurable illnesses are more common in this age group compared with younger populations.<sup>2</sup> The impact of these trends on hospice care policy cannot be underestimated. Hospice care plays a crucial role in providing comfort



and support for individuals with terminal illnesses during their final stages of life. With an increasing number of older adults requiring end-of-life care, it becomes essential for policy-makers and healthcare professionals to ensure that adequate resources are allocated towards hospice services. According to the WHO's World Report on Ageing and Health 2015, it is estimated that by 2050, China's elderly population will account for 24% of the global elderly population, and older people over 60 years old will make up 80% of terminally ill patients.<sup>3</sup>

Hospice care is a form of end-of-life care that is administered by healthcare professionals and volunteers who provide medical, psychological and spiritual support to terminally ill patients and their families with the aim of ensuring that they pass away peacefully, comfortably and with dignity.<sup>4</sup> Over the last 20 years, there has been a significant surge in the utilisation of hospice care. This trend highlights the pressing need for enhancing and refining hospice services, which is now considered a crucial global public health priority.<sup>5</sup> As the healthcare system strives towards people-centred healthcare policies, improving hospice care must remain at the forefront of its efforts. With an ageing population worldwide, it is expected that demand for these essential services will continue to rise in the coming years. Therefore, it is imperative that the healthcare system invests in developing innovative approaches to ensure that patients receive high-quality end-of-life care with dignity and compassion.<sup>6</sup> The current state of hospice care is a cause for concern, as the evidence suggests that there is an unmet need in this area. One of the key indicators of this issue is the fact that hospital-based hospice care programmes are only able to reach a median of 3.4% of all hospital patients. This means that many individuals who could benefit from hospice services are not receiving them, and may be left without adequate support during their end-of-life journey.<sup>7</sup> Statistics reveal that just 13.8% of intensive care unit admissions meet the criteria for hospice care consultation—a figure which highlights the urgent need for greater access to this vital service. It is imperative that the government works towards bridging this gap and ensuring that those who are facing terminal illness or end-of-life situations receive the compassionate support they deserve.<sup>8</sup> It is a widely accepted fact that one-third of patients with cancer who are hospitalised require hospice care consultation.<sup>9</sup> However, it is not just patients with cancer who need this kind of assistance; there is also an enormous unmet demand for hospice care among those suffering from kidney disease.<sup>10</sup> However, a report indicates that by 2020, only 510 hospitals (1.4 %) on the Chinese mainland are projected to possess hospice departments.<sup>11</sup>

Today's hospice has its origin in the UK. The UK was one of the first countries in the world to provide hospice care services, and charities played an important role in the process. The UK has more than 200 hospices with care provided by the National Health Service without charge to all permanent residents of the country.<sup>12</sup> In the USA, hospice care can be delivered in a variety of ways.<sup>13</sup>

Hospice services are provided to 1.65 million patients per year, 66% of which are delivered in a patient's residence and 26% in an inpatient hospice facility. Roughly 45% of all deaths in the USA in 2011 occurred within a hospice programme.<sup>14</sup>

The rise of hospice care in China was marked by the Tianjin Medical College Hospice Research Center in 1988. After 34 years of development, China's hospice medical practice has started, and the basic institutional settings and operation models have been established. From the perspective of ownership and the nature of institutional settings, hospice institutions in China are divided into three levels: the first is an independent hospice, the second is a separate ward or hospital attached to a general hospital or research institution and the third is family wards in the community healthcare system.<sup>15</sup>

This study aims to address the pressing need for improved end-of-life care options for the elderly population in China. This study employed the Anderson behavioural model as a theoretical framework to assess the desire and determinants influencing the selection of hospice facilities among the elderly population in China, with the aim of providing recommendations for further enhancing the growth of hospice care institutions. Andersen's behavioural model of health service utilisation was initially developed in the late 1960s and serves as a theoretical framework for analysing the factors that influence medical service utilisation.<sup>16</sup> As many countries are yet to establish a robust hospice care system, our study can offer valuable insights into how such systems can be developed and tailored according to each country's unique cultural context and healthcare infrastructure. By delving deeper into these factors, we aim not only to provide recommendations for further enhancing the growth of hospice care institutions in China but also contribute towards fostering a more compassionate and supportive environment globally for individuals approaching the end of life. Our ultimate goal is to improve access to high-quality end-of-life care services worldwide, ensuring that every individual receives dignified and personalised support during this challenging phase of life.

## MATERIALS AND METHODS

### Theoretical framework

Anderson's theoretical model was first created by Ronald Max Anderson in 1968 and was originally used to analyse the influencing factors of family medical services utilisation. After multiple supplements and testing, it is considered an authoritative model to analyse the influencing factors of individual health service utilisation and medical mode selection.<sup>17</sup> Its theoretical architecture is also gradually considered the most complete of various behavioural models of health service utilisation. According to Andersen, when individuals decide whether to use health services, they are influenced by three dimensions: predisposing factors (eg, age, education), enabling factors (eg, income, hospital density) and need

factors (eg, health status).<sup>18</sup> However, these three classical dimensions remain constant. Based on them, this study also discusses the factors affecting health-seeking preferences for hospice patients in Wuhu, China.

### Questionnaire

This study is based on Anderson model and references to relevant literature. The research group designed a questionnaire, and formed a final questionnaire after preinvestigation and several group discussions, covering the basic information, health status, attitude towards hospice care, choice of hospice care institutions and reasons of the older people. The study questionnaire was developed based on the Anderson Medical Services utilisation model framework, and after undergoing review, editing and verification by experts in clinical teaching hospitals and community health services. A total of 35 samples were collected, with approximately 5% of the samples undergoing a pilot investigation to assess the questionnaire's applicability and field operation procedures, gather feedback and make necessary modifications. In this study, the results showed that the questionnaire had a high level of internal consistency with a Cronbach's  $\alpha$  value between 0.78, indicating that the questions in the questionnaire were highly correlated and consistent with each other.

### Dependent variable

The willingness for hospice care service institutions was measured by using a situational question: 'When you are nearing the end of life, are you willing to accept hospice care service?' The response was divided into three categories: (1) I ask for hospice care (acceptable); (2) I am ambivalent; (3) I have no willingness for hospice care (unwilling).

The preferences for hospice care institutions were measured by using a question: 'When you are nearing the end of life, what kind of hospice care institution will you choose?' The response was divided into four categories: (1) Community Health Services Institution; (2) Hospice Ward of General Hospital; (3) Independent Hospice Care Facility; and (4) Aged Care Facility.

### Independent variables

Sociodemographic characteristics included age, gender (men, women), residence (rural, urban), age (60–69, 70–79,  $\geq 80$ ), monthly income (RMB) (<1500, 2=1500–3000, >3000), education (illiterate, primary school and junior high school, high school or above), medical expenses (rural residents basic medical insurance, urban employee basic medical insurance, urban residents basic medical insurance, self-financed medical service), live with your family (yes, no), chronic disease (yes, no), acute event or severe trauma (yes, no) and religious belief (yes, no).

### Study population and data collection

In May 2018, older individuals aged 60 and above were approached to participate in this study from 4 urban community centres in Wuhu City, Anhui Province, China.

Wuhu is a prefecture-level city, with the second largest economy in south-eastern Anhui province, China. Based on 2018 data, the total population was 3.7 million, with approximately 667 000 people aged 60 and above. In these four community centres, a total of 680 participants were willing to participate in the study. Participants aged 60 and above, who have lived in the community for a long time and are willing to participate in this survey. People who did not have basic language communication skills and critical illness were excluded. In total, 642 (94.4%) participants completed the questionnaire. The high participation rate (94.4%) was attributed to the provision of volunteering opportunities for older people and the unwavering commitment to respecting and safeguarding their rights and preferences. The research team successfully established a research partnership based on voluntary engagement, mutual understanding and trust by ensuring comprehensive disclosure and effective communication, thereby ensuring the seamless execution of the study and collection of high-quality data.

### Data entry and statistical analysis

Data were entered using Epidata V.3.1 which can limit the input outliers. Two researchers worked independently to enter and check the data. SPSS V.24.0 was used for data analysis. The sociodemographic characteristics of the older people were analysed with descriptive statistics and presented in percentages.  $\chi^2$  tests were used to analyse attitudes of the older people towards hospice care by sociodemographic factors. Ordered logistic regression models were used to assess the association between sociodemographic factors and attitudes of the older people towards hospice care. The reported CIs were calculated at the 95% level (95% CI). The statistical significance was 0.05.

## RESULTS

### Fundamental sociodemographic characteristics

The study delves into the sociodemographic characteristics of older individuals, as outlined in [table 1](#). The age range of participants spanned from 60 to 100 years old, with an average age of  $71.03 \pm 7.18$ . It was found that a majority of older people resided in rural areas (63.7%), were single (77.3%) and had limited education levels (48.1% being illiterate). Additionally, it was discovered that a significant portion of the older people population were insured by the new rural cooperative medical system (60%) and earned a monthly income between ¥1500–3000 (33.5%). Furthermore, over half of the elderly individuals surveyed reported having chronic diseases (58.4%), while nearly one-fourth experienced acute illnesses at some point during their lives (23.5%). These findings highlight important factors that may impact the health and well-being of older adults living in China's rural communities. Overall, this research provides valuable insights into the unique challenges faced by ageing populations in less urbanised regions and underscores the need for targeted

**Table 1** Univariate analysis of variables associated with attitudes of the elderly towards hospice care

| Variables                                 | Total (n=642)<br>N (%) | Attitudes of the elderly towards hospice care |                    |                   | $\chi^2$ /F value | P value |
|---|------------------------|---|--------------------|-------------------|-------------------|---------|
|   |                        | Acceptable (n=247)                            | Ambivalent (n=252) | Unwilling (n=143) |                   |         |
| <b>Gender</b>                             |                        |   |                    |                   |                   |         |
| 1=Male                                    | 367 (57.2)             | 145 (39.5%)                                   | 150 (40.9)         | 72 (19.6%)        | 3.52              | 0.172   |
| 2=Female                                  | 275 (42.8)             | 102 (37.1%)                                   | 102 (37.1)         | 71 (25.8%)        |                   |         |
| <b>Age (year)</b>                         |                        |   |                    |                   |                   |         |
| 1=60–69                                   | 295 (46.0)             | 117 (39.7%)                                   | 107 (36.3)         | 71 (24.1%)        | 5.98              | 0.201   |
| 2=70–79                                   | 262 (40.8)             | 97 (37.0%)                                    | 116 (44.3)         | 49 (18.7%)        |                   |         |
| 3= $\geq$ 80                              | 85 (13.2)              | 33 (38.8%)                                    | 29 (34.1)          | 23 (27.1%)        |                   |         |
| <b>Education level</b>                    |                        |   |                    |                   |                   |         |
| 1=Illiterate                              | 309 (48.1)             | 98 (31.7%)                                    | 143 (46.3)         | 68 (22.0%)        | 29.36             | 0.000   |
| 2=Primary school and junior high school   | 239 (37.2)             | 92 (38.5%)                                    | 85 (35.6)          | 62 (25.9%)        |                   |         |
| 3=High school or above                    | 94 (14.7)              | 57 (60.6%)                                    | 24 (25.5)          | 13 (25.5%)        |                   |         |
| <b>Living area</b>                        |                        |   |                    |                   |                   |         |
| 1=Urban area                              | 233 (36.3)             | 98 (42.1%)                                    | 77 (33.0)          | 58 (24.9%)        | 5.94              | 0.051   |
| 2=Rural area                              | 409 (63.7)             | 149 (36.4%)                                   | 175 (42.8)         | 85 (20.8%)        |                   |         |
| <b>Monthly income (RMB)</b>               |                        |   |                    |                   |                   |         |
| 1= <1500                                  | 320 (49.8)             | 109 (34.1%)                                   | 155 (48.4)         | 56 (17.5%)        | 46.97             | 0.000   |
| 2=1500–3000                               | 215 (33.5)             | 76 (35.3%)                                    | 66 (30.7)          | 73 (34.0%)        |                   |         |
| 3=>3000                                   | 107 (16.7)             | 62 (57.9%)                                    | 31 (29.0)          | 14 (13.1%)        |                   |         |
| <b>Medical expenses</b>                   |                        |   |                    |                   |                   |         |
| 1=Rural residents basic medical insurance | 385 (60.0)             | 145 (37.7%)                                   | 159 (41.3)         | 81 (21.0%)        | 5.08              | 0.534   |
| 2=Urban employee basic medical insurance  | 167 (26.0)             | 60 (35.9%)                                    | 65 (38.9)          | 42 (25.1%)        |                   |         |
| 3=Urban residents basic medical insurance | 79 (12.3)              | 36 (45.6%)                                    | 25 (31.6)          | 18 (22.8%)        |                   |         |
| 4=Self-financed medical service           | 11 (1.7)               | 6 (54.5%)                                     | 3 (27.3)           | 2 (18.2%)         |                   |         |
| <b>Live with your family</b>              |                        |   |                    |                   |                   |         |
| 1=Yes                                     | 470 (73.2)             | 199 (42.3%)                                   | 152 (32.3)         | 119 (25.3%)       | 35.47             | 0.000   |
| 2=No                                      | 172 (26.8)             | 48 (27.9%)                                    | 100 (58.1)         | 24 (14.0%)        |                   |         |
| <b>Chronic disease</b>                    |                        |   |                    |                   |                   |         |
| 1=Yes                                     | 375 (58.4)             | 152 (40.5%)                                   | 136 (36.3)         | 87 (23.2%)        | 3.39              | 0.184   |
| 2=No                                      | 267 (41.6)             | 95 (35.6%)                                    | 116 (43.4)         | 56 (21.0%)        |                   |         |
| <b>Acute event or severe trauma</b>       |                        |   |                    |                   |                   |         |
| 1=Yes                                     | 151 (23.5)             | 51 (33.8%)                                    | 60 (39.7)          | 40 (26.5%)        | 2.72              | 0.257   |
| 2=No                                      | 491 (76.5)             | 196 (39.9%)                                   | 192 (39.1)         | 103 (21.0%)       |                   |         |
| <b>Religious belief</b>                   |                        |   |                    |                   |                   |         |
| 1=Yes                                     | 67 (10.4)              | 24 (35.8%)                                    | 20 (29.9)          | 23 (34.3%)        | 6.70              | 0.035   |
| 2=No                                      | 575 (89.6)             | 223 (38.8%)                                   | 232 (40.3)         | 120 (20.9%)       |                   |         |



interventions to support their physical and mental health needs moving forward. The population surveyed in this study was found to have a diverse range of religious beliefs, with 10.4% identifying as religious. Of those who identified as such, the majority (53.7%) were followers of Buddhism, while 37.3% followed Christianity. When it came to hospice care, opinions were more divided. While a significant portion of respondents (38.5%) expressed that they would accept hospice care if needed, there were also those who were unwilling to do so (22.3%). Almost 40% of participants reported feeling ambivalent about hospice care—reflecting the complex emotions and difficult decisions that arise when considering end-of-life options.

### The willingness of older people to choose hospice care institutions in Wuhu

According to the data presented in [table 1](#), a total of 642 elderly individuals were enrolled in this study. Among them, 57.2% were men and 46.0% belonged to the age group of 60–69 years. The findings reveal that there is a significant demand for hospice services among the older population in Wuhu City. It was observed that nearly half (47%) of the participants preferred hospice care within general hospitals while only a small proportion (11.4%) opted for aged care facilities. Additionally, around one-third (28%) chose community health service institutions and approximately one-eighth (13.6%) selected independent hospice care facilities.

Furthermore, the majority of older individuals prefer to receive hospice care in general hospital wards. Overall, these findings shed light on the current state of hospice service utilisation among older adults in Wuhu City and emphasise the importance of developing effective

strategies to meet their unique needs and preferences during end-of-life care planning. In the study, the researchers investigated other related questions. ‘When you are nearing the end of life, what kind of hospice care institution will you choose?’ The first place is the hospital. ‘When you are nearing the end of life, what kind of hospice care institution will you choose?’ Most of the older people chose active treatment in a general hospital.

### Characteristics of factors influencing the willingness of older people to choose hospice facilities

According to the Andersen model, when individuals decide whether to use health services, they are influenced by three dimensions: predisposing factors (eg, gender, age, education), enabling factors (economic status, family situation) and need factors (self-report health, more than one chronic disease). These factors, which are the independent variables, play a crucial role in determining the outcome or behaviour of a particular phenomenon. The attitude of the older people towards hospice care was the dependent variable (assignment: acceptable=1, ambivalent=2, unwilling=3), multicollinear diagnosis with statistical significance in univariate analysis, variance inflation factor (VIF) <10 (VIFmin=1.003, VIFmax=1.594), indicating that there was no multicollinearity between 4 independent variables and dependent variables, which can be included in the multiple regression analysis. The regression model was significant ( $p < 0.001$ ), with a good fit ( $p > 0.05$ ) and passed the parallelism test ( $p = 0.136$ ). The results of multifactor ordered logistic regression analysis showed that education level and monthly income were the influencing factors of the attitude of the older people towards hospice care ( $p < 0.05$ ), as shown in [table 2](#). The more educated the

**Table 2** Ordinal logistic regression analysis on variables associated with attitudes of the elderly towards hospice care

| Variable                              | B      | SE    | Wald $\chi^2$ | P value | OR (95% CI)            |
|---------------------------------------|--------|-------|---------------|---------|------------------------|
| Education level                       |        |       |               |         |                        |
| Illiterate                            | 0.916  | 0.285 | 10.294        | 0.001   | 2.498 (1.428 to 4.370) |
| Primary school and junior high school | 0.648  | 0.273 | 5.639         | 0.018   | 1.913 (1.120 to 3.266) |
| High school and above (ref)           | 0*     |       |               |         |                        |
| Monthly income                        |        |       |               |         |                        |
| ¥0–1500                               | 0.248  | 0.271 | 0.843         | 0.358   | 1.282 (0.754 to 2.179) |
| ¥1500–3000                            | 0.842  | 0.257 | 10.733        | 0.001   | 2.322 (1.403 to 3.843) |
| >¥3000 (ref)                          | 0*     |       |               |         |                        |
| Live with family                      |        |       |               |         |                        |
| Yes                                   | −0.112 | 0.177 | 0.400         | 0.527   | 0.894 (0.632 to 1.265) |
| No (ref)                              | 0*     |       |               |         |                        |
| Religious belief                      |        |       |               |         |                        |
| Yes                                   | 0.453  | 0.242 | 3.505         | 0.061   | 1.572 (0.979 to 2.526) |
| No (ref)                              | 0*     |       |               |         |                        |

\*Set to zero because this parameter is redundant.  
ref, reference group.



group, the higher their acceptance rate of hospice care services. The higher the income level, the higher the acceptance rate of hospice care.

The univariate analysis in [table 1](#) shows that with the higher the education level, the higher the proportion of hospice care received. 60.6% of high school or above chose to receive hospice care. The higher the monthly income, the higher the proportion of receiving hospice care. 57.9% of the older people with a monthly income higher than ¥3000 would choose hospice care.

[Table 3](#) shows that the proportion of older women choosing a hospice ward or general hospital was 53.8%, which was higher than that of older men at 42.0%. The proportion of older men choosing a community health service institution was 31.6%, higher than 23.3% of women. This shows that there are gender differences in the willingness of the older people to choose hospice care services. Compared with men, women are more inclined to choose a hospice ward or general hospital. There are also differences in the willingness of older people of different ages to choose hospice care services. 56.9% of the older people aged 60–69 chose a hospice ward of general hospital, which is higher than that of the older people aged 70–79 and over 80 years old. The older people over 70 years old are more willing to choose community health service institutions.

[Table 3](#) shows that older people with different educational levels and incomes also have different willingness to choose hospice care services. The proportion of the older people with illiterate and primary and junior high school education who choose the hospice ward of general hospital is higher than that of senior high school and above. The proportion of older people in high school and above choosing the community health services institution as a hospice care service place is higher than that of older people with illiterate and primary school and junior high school education.

41.1% of the older people with a personal monthly income of more than ¥3000 chose the community health services institution, which is higher than other income groups. Only 19.1% of the elderly with a personal monthly income of less than ¥1500 chose the community health services institution, while most of them chose the hospice ward of general hospital. The choices of the older people with different payment forms for medical expenses are also significantly different. 51.2% of the older people in the new rural cooperative medical system chose the hospice ward of general hospital, while 52.7% of the older people with urban employee medical insurance chose the community health services institution.

The area of residence differs markedly between the older people in urban and rural areas. Nearly half of the older people in urban areas chose the community health services institution as the place of hospice care, and more than half of the older people in rural areas chose the hospice ward of general hospital. The proportion of the older people who live with their families who choose the community health services institution is significantly

higher than that of the older people who do not live with their families.

The multinomial logistic regression analysis of choosing hospice care service institutions' preferences is presented in [table 4](#). Variables found to be significantly correlated in multinomial logistic regression analysis changed significantly after controlling for demographic variables. There are three sets of data in the regression model, respectively, for 'community health services institution', 'hospice ward of general hospital' and 'independent hospice care facility'. The 'aged care facility' data in the dependent variable were used as the reference group.

Regardless of the place of hospice care, older men had lower odds of being more willing to hospice service willingness compared with older women ([table 4](#)). Differences in marital status and educational level are also important influencing factors in the older people's hospice care willingness. Respondents with illiterate and in primary school and junior high school were less likely to be more willing to choose a professional hospice place as compared with those in high school and above.

## DISCUSSION

Improving hospice care is a global public health priority that aims to avoid overtreatment, reduce medical costs and improve the quality of life of dying patients to 'die well'. 'Good death' is the common pursuit of human beings. A calm, peaceful and dignified death is the internal need of the older people and their families and is also an important symbol of social civilisation and progress.<sup>19</sup> According to the 2015 'Global Quality of Death Index' released by the Economist Intelligence Unit, the quality of hospice care in 80 countries and regions was measured by five dimensions: palliative care environment, human resources, medical care affordability, care quality and public participation. The UK ranked first, while China ranked only 71st.<sup>20</sup> The report reflects the overall low availability and quality of hospice care resources in China.

Wuhu City has entered an ageing society early, with a high proportion of elderly population, a rapid ageing process, a large rural older population and ahead of economic and social development; these are inherent characteristics of ageing. Currently, the Chinese elderly population requires multilevel hospice care services. General hospitals are chosen by nearly half of the older people in Wuhu, followed by community health service institutions. It shows that the needs of hospice care services are different in the last journey of their life. The purpose of hospice care is to prolong the lifespan and improve the quality of life. The Chinese government has gradually begun to attach importance to the development of hospice care and has taken various measures. To allow elders to live comfortably and die with dignity, the 'Notice on Guiding Opinions on Promoting the Combination of Medical and Health Services with Old-age Care Services' forwarded by the General Office of the State Council of the People's Republic of China clearly stated

**Table 3** Univariate analysis of the differences of patients' willingness to choose hospice care service institutions

|   | Total (n=642) | Choosing community health services institution (n=180) | Choosing hospice ward of general hospital (n=302) | Choosing independent hospice care facility (n=87) | Choosing aged care facility (n=73) | $\chi^2/F$ value | P value |
|---|---------------|--|---|---|------------------------------------|------------------|---------|
| Variables                                 | N (%)         |  | N (%)   |   |                                    |                  |         |
| Gender                                    |               |  |   |   |                                    |                  |         |
| 1=Male                                    | 367 (57.2)    | 116 (31.6)   | 154 (42.0)  | 47 (12.8)   | 50 (13.6)                          | 12.77            | 0.005   |
| 2=Female                                  | 275 (42.8)    | 64 (23.3)  | 148 (53.8)  | 40 (14.5)   | 23 (8.4)                           |                  |         |
| Age (year)                                |               |  |   |   |                                    |                  |         |
| 1=60–69                                   | 295 (46.0)    | 68 (23.1)  | 168 (56.9)  | 30 (10.2)   | 29 (9.8)                           | 22.89            | 0.001   |
| 2=70–79                                   | 262 (40.8)    | 82 (31.3)  | 101 (38.5)  | 44 (16.8)   | 35 (13.4)                          |                  |         |
| 3= $\geq$ 80                              | 85 (13.2)     | 30 (35.3)  | 33 (38.8)   | 13 (15.3)   | 9 (10.6)                           |                  |         |
| Education level                           |               |  |   |   |                                    |                  |         |
| 1=Illiterate                              | 309 (48.1)    | 53 (17.2)  | 162 (52.4)  | 54 (17.5)   | 40 (12.9)                          | 50.90            | 0.000   |
| 2=Primary school and junior high school   | 239 (37.2)    | 79 (33.1)  | 104 (43.5)  | 26 (10.9)   | 30 (12.6)                          |                  |         |
| 3=High school or above                    | 94 (14.7)     | 48 (51.1)  | 36 (38.3)   | 7 (7.4)   | 3 (3.2)                            |                  |         |
| Living area                               |               |  |   |   |                                    |                  |         |
| 1=Urban area                              | 233 (36.3)    | 102 (43.8)   | 86 (36.9)   | 20 (8.6)  | 25 (10.7)                          | 47.09            | 0.000   |
| 2=Rural area                              | 409 (63.7)    | 78 (19.1)  | 216 (52.8)  | 67 (16.4)   | 48 (11.7)                          |                  |         |
| Monthly income (RMB)                      |               |  |   |   |                                    |                  |         |
| 1= <1500                                  | 320 (49.8)    | 61 (19.1)  | 166 (51.9)  | 55 (17.2)   | 38 (11.9)                          | 29.90            | 0.000   |
| 2=1500–3000                               | 215 (33.5)    | 75 (34.9)  | 95 (44.2)   | 20 (9.3)  | 25 (11.6)                          |                  |         |
| 3=>3000                                   | 107 (16.7)    | 44 (41.1)  | 41 (38.3)   | 12 (11.2)   | 10 (9.3)                           |                  |         |
| Medical expenses                          |               |  |   |   |                                    |                  |         |
| 1=Rural residents basic medical insurance | 385 (60.0)    | 72 (18.7)  | 197 (51.2)  | 64 (16.6)   | 52 (13.5)                          | 77.25            | 0.000   |
| 2=urban employee basic medical insurance  | 167 (26.0)    | 88 (52.7)  | 56 (33.5)   | 9 (5.4)   | 14 (8.4)                           |                  |         |
| 3=urban residents basic medical insurance | 79 (12.3)     | 16 (20.3)  | 42 (53.2)   | 14 (17.7)   | 7 (8.9)                            |                  |         |
| 4=Self-financed medical service           | 11 (1.7)      | 4 (36.4)   | 7 (63.6)  | 0 (0)   | 0 (0)                              |                  |         |
| Live with your family                     |               |  |   |   |                                    |                  |         |
| 1=Yes                                     | 470 (73.2)    | 156 (33.2)   | 220 (46.8)  | 41 (8.7)  | 53 (11.3)                          | 46.83            | 0.000   |
| 2=No                                      | 172 (26.8)    | 82 (14.0)  | 82 (47.7)   | 46 (26.7)   | 20 (11.6)                          |                  |         |
| Chronic disease                           |               |  |   |   |                                    |                  |         |
| 1=Yes                                     | 375 (58.4)    | 104 (27.7)   | 186 (49.6)  | 43 (11.5)   | 42 (11.2)                          | 4.20             | 0.241   |
| 2=No                                      | 267 (41.6)    | 76 (28.5)  | 116 (43.4)  | 44 (16.5)   | 31 (11.6)                          |                  |         |
| Acute event or severe trauma              |               |  |   |   |                                    |                  |         |
| 1=Yes                                     | 151 (23.5)    | 36 (23.8)  | 60 (39.7)   | 27 (17.9)   | 28 (18.5)                          | 15.14            | 0.002   |

Continued



Table 3 Continued

|                  | Total (n=642) | Choosing community health services institution (n=180) | Choosing hospice ward of general hospital (n=302) | Choosing independent hospice care facility (n=87) | Choosing aged care facility (n=73) | $\chi^2$ /F value | P value |
|------------------|---------------|--|---|---|------------------------------------|-------------------|---------|
| Variables        | N (%)         |  | N (%)   |   |                                    |                   |         |
| 2=No             | 491 (76.5)    | 114 (29.3)   | 242 (49.3)  | 60 (12.2)   | 45 (9.2)                           |                   |         |
| Religious belief |               |  |   |   |                                    |                   |         |
| 1=Yes            | 67 (10.4)     | 16 (23.9)  | 29 (43.3)   | 12 (17.9)   | 10 (14.9)                          | 2.57              | 0.464   |
| 2=No             | 575 (89.6)    | 164 (28.5)   | 273 (47.5)  | 75 (13.0)   | 63 (11.0)                          |                   |         |

its aim: to provide older people with treatment-related hospitalisation, rehabilitation-related care, stable life care and hospice care integration for health and pension services.<sup>21</sup> The 'Implementation Opinions of the People's Government of Wuhu City on Accelerating the Development of the Elderly Service Industry' pointed out that Wuhu City should promote the development of institutions that integrate medical care and elderly care. Priority

will be given to the construction of old-age care institutions that integrate medical care, medical care, rehabilitation and hospice care.<sup>22</sup>

Since the reform and opening up, China's medical and healthcare and elderly care service system have made great progress, but the development of hospice care service and talent team construction is still in the initial stage, which has an obvious lag compared with the rapid growth of

Table 4 The multinomial logistic regression analysis on the influencing factors of choosing hospice care service institutions for the elderly

| Variable                              | Hospice service willingness to exchange, OR (95% CI) |                                  |                                   |
|---------------------------------------|--|----------------------------------|-----------------------------------|
|                                       | Community health services institutions               | Hospice ward of general hospital | Independent hospice care facility |
| Gender                                |  |                                  |                                   |
| Male                                  | 0.491* (0.246 to 0.905)                              | 0.439* (0.225 to 0.750)          | 0.459* (0.228 to 0.942)           |
| Female (ref)                          | 1.0  | 1.0                              | 1.0                               |
| Age                                   |  |                                  |                                   |
| 60–69 years old                       | 0.388 (0.146 to 1.016)                               | 1.048 (0.437 to 2.741)           | 0.608 (0.206 to 1.749)            |
| 70–79 years old                       | 0.485 (0.189 to 1.205)                               | 0.578 (0.240 to 1.417)           | 0.716 (0.262 to 2.202)            |
| 80 years and older (ref)              | 1.0  | 1.0                              | 1.0                               |
| Education level                       |  |                                  |                                   |
| Illiterate                            | 0.087* (0.020 to 0.380)                              | 0.168* (0.039 to 0.705)          | 0.298 (0.206 to 1.794)            |
| Primary school and junior high school | 0.162* (0.040 to 0.661)                              | 0.175* (0.041 to 0.686)          | 0.315 (0.262 to 2.020)            |
| High school and above (ref)           | 1.0  | 1.0                              | 1.0                               |
| Residential area                      |  |                                  |                                   |
| Rural area                            | 0.636 (0.261 to 1.652)                               | 0.367* (0.159 to 0.889)          | 0.366 (0.128 to 1.108)            |
| Urban area (ref)                      | 1.0  | 1.0                              | 1.0                               |
| Personal monthly income               |  |                                  |                                   |
| ¥0–1500                               | 2.082 (0.717 to 6.097)                               | 1.921 (0.717 to 5.289)           | 0.789 (0.232 to 2.652)            |
| ¥1500–3000                            | 1.740 (0.644 to 4.614)                               | 1.634 (0.640 to 4.272)           | 0.753 (0.28 to 2.463)             |
| >¥3000 (ref)                          | 1.0  | 1.0                              | 1.0                               |
| Live with family                      |  |                                  |                                   |
| Yes                                   | 1.798 (0.830 to 3.706)                               | 0.934 (0.441 to 1.617)           | 0.335* (0.157 to 0.695)           |
| No (ref)                              | 1.0  | 1.0                              | 1.0                               |
| Acute event or severe trauma          |  |                                  |                                   |
| Yes                                   | 0.567 (0.293 to 1.100)                               | 0.398* (0.207 to 0.694)          | 0.688 (0.337 to 1.400)            |
| No (ref)                              | 1.0  | 1.0                              | 1.0                               |

\*Statistically significant.  
ref, reference group.



hospice care service utilisation demand under the ageing trend in China. Studies have shown that in terms of location preference for hospice service utilisation, the vast majority of elderly dying people in both Western and Asian countries tend to choose a home and hope to be accompanied by family members at the end of life.<sup>23</sup> The preferences for hospice care institutions were measured by using a question: ‘When you are nearing the end of life, what kind of hospice care institution will you choose?’ The first is a hospice ward of general hospital. In general, the older people at the end of life are more likely to have cognitive impairment, physical function or behaviour limitation, advanced disease and rapid disease development. These older people are more likely to need specialised hospice care services.<sup>24</sup> For the same reason, ‘When you are nearing the end of life, what kind of hospice care institution will you choose?’ The first place is the hospital. ‘When you are nearing the end of life, what kind of hospice care institution will you choose?’ Most of the older people chose active treatment in a general hospital. A study have shown that hospice in community, as a form of hospice care, can integrate the advantages of home and institutional hospice care services to better meet the needs and service utilisation preferences of the older people.<sup>25</sup>

The research team set up multiple-choice questions such as ‘the reason why you can accept hospice care’ in the survey, 79.6% of the older people chose ‘can avoid some unnecessary medical treatment and save medical expenses’, 58.6% of the older people chose ‘Hospice care can provide a relatively peaceful and comfortable environment’, and 54.3% of the older people chose ‘hospice care can help family members take care of patients’. It can also be seen that the needs of the older people for hospice care are multifaceted and multilayered, and need multifaceted cooperation to complete.

In this research, the researchers can also find that men and women tend to choose hospice institutions differently. Older women are more willing to choose hospice wards in general hospitals than older men. There is probably a connection between the different psychological states of different gender and older people in the face of death. Diversification of hospice care services has become a significant focus in the hospice industry, and it can provide more options for end-of-life care for the older people. The factors affecting patient preferences for hospice care services, such as marital status, educational level and living area, serve as important considerations for service providers to expand their offerings. Hospice care providers can consider the unique needs and preferences of patients based on their marital status, educational level and living area, and tailor their services accordingly. For patients who live alone, providers may offer more extensive support services, including daily living assistance and emotional support. For patients with lower educational levels, hospice care providers may provide more education to them and their families about their condition, the potential outcomes and how to manage symptoms effectively.

Since 2017, 71 cities have become pilot areas of hospice care to establish a localised hospice care system that fits the sociocultural context of the Mainland of China. These pilot areas for hospice care include major cities like Beijing, Shanghai and Guangzhou, as well as smaller cities and rural areas. The government has established policies that encourage the establishment of hospice care facilities and has provided funds for training medical professionals to provide palliative care.<sup>26</sup> Shanghai, a bustling metropolis in China, has been at the forefront of healthcare innovation. As one of the earliest pilots for community health service centres, Shanghai has made significant strides in providing hospice care to its citizens. With 247 such centres spread across the city, patients have access to 3 different modes of hospice care: outpatient services, inpatient services and home services. In recent years, there has been a growing demand for affordable medical resources in China. In response to this need, Shanghai conducted a study which found that home services are not only convenient but also cost-effective. This mode of medical service is particularly suitable for those who face difficulties accessing traditional healthcare facilities due to distance or mobility issues. The success of these community health service centres can be attributed to their focus on patient-centred care. By offering personalised treatment plans and support systems tailored to each individual’s needs, these centres have become an integral part of Shanghai’s healthcare system. Overall, Shanghai’s commitment towards improving access to quality healthcare is commendable and serves as an inspiration for other cities around the world facing similar challenges.<sup>27</sup> As the construction effect of community health services in rural areas is far behind that of urban areas, rural older people will bear a heavier economic burden to seek hospice care services, which could be a possible reason why they are more inclined to choose the hospice wards of general hospital.

The study found that older people with new rural cooperative medical insurance and self-paying and older people with personal monthly income of less than ¥1500 prefer to receive hospice care services in the hospice ward of general hospital. Although independent hospice care facilities or aged care facilities can also provide relatively professional services, due to the private nature of most of them, they cannot be in line with the government’s medical insurance policy. Americans have expanded hospice so that most hospice services are covered by Medicare. But also faced a series of problems, they made a series of rules and regulations to ensure the normal operation and profitability of hospice care.<sup>28</sup> Japan’s national insurance covers all medical care including palliative care. Japan’s national insurance covers all medical care including palliative care. The inclusion of inpatient palliative care services by National Insurance commenced in 1990, followed by the expansion to community home care services in 1992. In 2002, National Insurance subsidised the costs of hospital palliative care teams; in 2006, home hospice clinics and day care hospices were added to the



National Insurance system.<sup>29</sup> Facing the predicament of China, some cities have begun to explore the long-term care insurance system and try to incorporate hospice care into the long-term care insurance, which is also a basis for us to provide us with a medical insurance system suitable for China.

Despite the numerous hospice and palliative care facilities that have emerged in various provinces over the past few decades, these services remain largely fragmented and disconnected from the broader healthcare system. While there has been progress made towards improving end-of-life care for patients, much work remains to be done in terms of integrating these vital services into mainstream medical practice.<sup>30</sup> The pressing need for hospice care services in China is becoming increasingly apparent as the population continues to age. Unfortunately, the number of facilities available to meet this demand falls far short of what is required. Currently, most hospice care services are provided within tertiary hospitals where specialised medical professionals can offer expert treatment and support.<sup>31</sup> It is crucial to prioritise the preferences of individuals who opt for spending their final moments in the comfort of their own residences. As such, it is crucial that hospice and palliative care services extend beyond traditional hospital or hospice settings, allowing for a more personalised and compassionate approach to end-of-life care.<sup>32</sup> By providing these essential services outside of formal institutions, patients can receive the support they need while maintaining a sense of familiarity and security within their own surroundings.<sup>33</sup> This not only enhances their quality of life but also provides peace of mind for loved ones who may be caring for them during this difficult time. Now, with the support of the government, community-based hospice and palliative care services will also be a focus of development in the next decade. At the same time, it is necessary to explore appropriate service models to ensure that patients can receive continuous care across different facilities.

The hospice care system in China is still in its early stages, and there are challenges that need to be addressed. One challenge is the cultural taboo surrounding death and dying, which prevents some families from seeking hospice care for their loved ones. Additionally, there is limited awareness among many healthcare providers about the benefits of palliative care. However, the establishment of pilot areas for hospice care has been a positive step towards improving end-of-life care in China. It is hoped that these efforts will continue to expand and contribute to the development of a comprehensive and culturally sensitive hospice care system throughout the country.

Relevant constraints should be taken into account in the present study. First, self-report questionnaires are commonly used in research studies to gather information directly from individuals. These questionnaires may introduce certain limitations such as recall and reporting bias. Second, this study did not adequately address or control for confounding factors. The present paper encompasses several issues that warrant further exploration, including

the enhancement of the hospice care service system and the seamless integration of hospice care principles with cutting-edge medical resources. These aspects necessitate a more profound investigation, analysis and discourse.

## CONCLUSION

The city of Wuhu in China has experienced an early onset of population ageing. The high proportion and rapid process of ageing, along with the large rural elderly population and leading economic and social development, are inherent characteristics of this region's ageing situation. However, there is an increasing demand for hospice services for these elderly individuals that is currently insufficiently met. Regarding the utilisation of hospice care services, it was found that the elderly in Wuhu tend to prefer general hospitals and community health service institutions. This may have something to do with older adults' reliance on medical professionals and their quest for comfort and familiarity. However, it also exposes the imbalance between the supply and demand of hospice care services, as well as the confusion and helplessness of service users when choosing. The study also found differences in the choice of hospice services for different older adults. Older women are more likely to choose hospice wards in general hospitals, which may be related to their psychological state when facing death. On the other hand, most elderly people choose to be actively treated in general hospitals, which may reflect their trust in modern medical technology and pursuit of quality of life. In order to meet the diverse needs of hospice care, community hospice care as a new form of care came into being. This format combines the advantages of home and institutional hospice services to provide more options for seniors. At the same time, the factors that affect patients' preference for hospice services, such as marital status, education level and living area, should be taken into account and service providers should tailor their services. With the accelerated ageing process of Chinese society, the demand for hospice care services will continue to grow. Therefore, the government and all sectors of society should strengthen cooperation to improve the supply capacity and service quality of hospice care services to meet the needs of the elderly and improve their quality of life.

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