Research on the Satisfaction of Elderly People with Smart Elderly Service and Its Influencing Factors: Based on A Survey in Chengdu, Sichuan Province

Chenyu Chen

School of Public Administration, Sichuan University, Chengdu 610000, China

Abstract

The article designed a scale of influencing factors of elderly users' satisfaction with smart elderly services, constructed an analytical model of influencing factors-satisfaction-continuity motivation, and took elderly people who had used smart elderly services in Chengdu as the respondents. The results of the empirical analysis showed that there was no correlation between users' expectations and satisfaction with smart elderly services; perceived ease of use was related to satisfaction, but the linear relationship between the two did not hold. Perceived quality has a significant positive effect on satisfaction, and satisfaction also has a significant positive effect on the continuity motivation of the elderly. Further, suggestions for improving the wisdom elderly service in Chengdu were put forward: promoting the research and development of wisdom elderly product design and enriching the supply of practical wisdom elderly products; enhancing the information security management of wisdom elderly products and online wisdom elderly service platform; strengthening the construction of network infrastructure and optimising the platform response mechanism; accelerating the training of professional talents for the elderly service team; promoting the popularisation of smart technology and crossing the elderly "digital divide", etc.

Keywords

Smart elderly care, Smart elderly service, Satisfaction.

1. Introduction

The aging of the population is the main population phenomenon in the 21st century. With the acceleration of the aging process of the population, the problem of providing for the aged is becoming more and more prominent. To solve the problem of providing for the aged has become the focus of everyone's attention, and the state and the government have attached great importance to the development of China's pension service industry, and strongly supported the practical exploration in line with the national conditions. In addition, the views of many elderly people on providing for the aged have also changed, becoming more independent and positive. They began to pay more attention to their own quality of life, and the smart elderly care model can better meet their pension needs.

Under the background of accelerating the process of population aging, the traditional pension model can not meet the needs, the clear direction of national policy, the rapid development of information technology and the innovation of traditional pension concept, smart elderly care emerges as the times require. On the whole, smart elderly care is in the ascendant, but it can be predicted that it has broad prospects for development.

This study actively responds to the call of the country to develop smart elderly care services, focusing on the satisfaction and influencing factors of elderly users in Chengdu for smart elderly care services. Through the form of field questionnaires, they get the most real feedback on smart elderly care services, which is conducive to targeted improvement of services, promote

the improvement and improvement of smart elderly care service system, and effectively improve the quality of old-age services for the elderly. In addition, the smart elderly care service will promote the overall improvement of the community pension environment and the improvement and upgrading of related facilities, which will be of great benefit to the improvement of the quality of life of the elderly groups in their twilight years, and can also promote the employment of the relevant employees, thus promoting economic development and ensuring the sustainable development of the smart elderly care service industry.

2. Literature References

In the aspect of theoretical research, Balta-Ozkan, Davidson, Bicket (2013) and others believe that intelligent home pension is to use smart home to track and monitor the elderly remotely through information technology. Marie Chan (2009) and others think that the intelligent home pension service system is based on the needs of users and integrates all kinds of resources. Sanna Sintonen and Mika Immonen (2013) further developed the concept, arguing that smart home pension services include daily life, medical care, health screening, and security and privacy services. Lemlouma, Laborie and Roose (2013) propose an automatic dependency assessment framework that intelligently assesses changes in the needs of older persons and provides them with the services they need in a timely manner.

Quite a lot of research on smart elderly care has focused on the development and design of smart elderly care products. In fact, due to the advanced science and technology of western developed countries and the wide popularity of the Internet, scholars have already explored how to apply intelligent equipment to the field of providing for the aged. Jan-Willem Van (2011) et al proposed that information and communication technologies be effectively used for socialization through virtual communities, which can be used to support many processes in the geriatric care sector. Generally speaking, the virtual community can be approximately regarded as the intelligent community, through the virtual community to provide nursing services for the elderly, and further create a benign interactive system of smart elderly care. The research on the design and use of intelligent products in the field of smart elderly care services used by foreign scholars started earlier and thoroughly. N.K. Suryadevara (2012) et al try to use home monitoring based on wireless sensor network technology to monitor the daily family activities of the elderly and respond immediately to changes in their daily normal activities. Rashidi Parisa and Mihailidis Alex (2013) believe that the development of innovative auxiliary life technology is conducive to independent aging, and summarizes the most advanced "environmental auxiliary life" (AAL) tool for the elderly based on environmental intelligence paradigm. On the whole, they believe that the current AAL system is still unable to provide comprehensive high-quality pension and health care services, and more importantly, many older people may avoid using these systems because they feel the complexity of the system.

In recent years, the research focus of smart elderly care in the field of intelligent technology has gradually shifted to the field of robotics. Manuele Bonaccorsi (2016) et al investigated and assessed the potential of cloud robotics systems in providing sustainable care services and confirmed that cloud robotics services can promote active and healthy ageing. In the Tijs Vandemeulebroucke (2018) study, it is also mentioned that nursing robots are becoming more and more common in pension environments.

In the study of the acceptance of the smart elderly care model by the elderly group, FD Davis (1989) uses TAM model to analyze whether the smart elderly care product can be accepted by the elderly depends on the degree of satisfaction of the product to the needs of the elderly and the difficulty of operation. Viswanath Venkatesh (2003) et al., through the UTAUT model, discussed how the elderly accept smart elderly care products. Sara J. Czaja and Chin Chin Lee (2007) argue that in order for technology to be useful and available to older persons, the

research and design community must better understand the needs, preferences and abilities of older persons. Demiris George (2008) et al., who conducted a participatory assessment of smart home applications for the elderly, found that residents generally have a positive attitude towards smart home projects, and that they have three stages of adoption and acceptance of the project: awareness, adaptation and full recognition. An empirical study by Sanna Sintonen and Mika Immonen (2013) found that technical anxiety only caused non-sense of security in the frail elderly, thus indirectly curbing the use of new services. For other elderly people, the effectiveness and reliability of services will have a more positive impact on their willingness to use remote care services.

3. Research and Design

3.1. Theoretical Models and Assumptions

3.1.1. Theoretical Model

According to the SCSB model of Sweden, the ACSI model of the United States and the ECSI model of Europe, customer satisfaction is mainly affected by customer expectation, perceived quality and perceived value. As a quasi-public product, the value of smart elderly care service can not be measured by money, so this study eliminates the structural variable of "perceived value". At the same time, referring to the survey design of other scholars, adding the research dimension of perceived ease of use, a total of three research dimensions are constructed, each of which sets different measurement indicators. Through empirical research, this paper analyzes whether these three dimensions affect the final satisfaction. At the same time, the model modifies the expression of "customer loyalty" to "continuous motivation" and introduces it into the model for further study, as shown in figure 1.
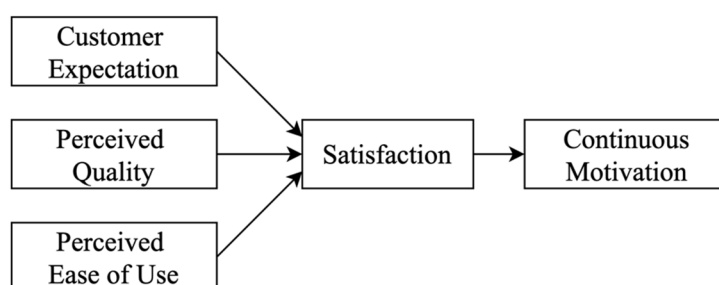

Figure 1. Satisfaction model of smart elderly care service

3.1.2. Research Hypothesis

(1) The influence of user expectation on the satisfaction of smart elderly care service. User expectation refers to the services that the elderly expect to receive before receiving smart elderly care services. Customer satisfaction theory holds that satisfaction depends on the difference between perceived service quality and expectation, and the customer satisfaction index evaluation model established in various countries also confirms the influence of user expectation on satisfaction. Once people have a demand for something, they have expectations. If they have high expectations before buying a product or accepting a service, this expectation tends to be higher than their demand, and when the purchase occurs or after the service is completed, it results in a reduction in satisfaction because it does not meet their expectations, so make assumptions H1: there is a negative correlation between user expectation and satisfaction of smart elderly care service.

(2) The influence of perceptual quality on the satisfaction of smart elderly care service. Perceived quality refers to the actual feeling of smart elderly care products or smart elderly

care services in the process of use and after use by the elderly, and is the core variable in the model. Many scholars have shown that there is a correlation between service quality and customer satisfaction: Dai Mingye (2014) believes that perceived quality is the most important factor affecting customer satisfaction. The empirical study of Liu Wei (2016) shows that perceived quality has a positive impact on the public satisfaction of pension services in medical and nursing institutions. Smart elderly care services include all aspects of material and spiritual aspects. The quality of pension services directly determines the living standards of the elderly, and the perception of the quality of services of the elderly also affects the satisfaction of the elderly with the smart elderly care services. Referring to the structure diagram of smart elderly care service quality built by scholar Li Jing et al. (2020) and the model structure diagram of "Internet + pension" built by scholars Yu Xiao and Sun Yue (2017), this study divides perceptual quality into three dimensions: perceptual quality of intelligent health pension service products, perceived quality of online smart elderly care service platform and perceived quality of offline smart elderly care service resources. The first observation variable of perceptual quality of intelligent health pension service products mainly refers to the Action Plan for the Development of Intelligent Health Endowment Industry (2017-2020). The second observation variable of perceptual quality of smart elderly care service platform on the latent variable line refers to the five dimensions of information technology service quality model put forward by scholar Wang Zhipeng. The third latent variable is the observation variable of perceptual quality of smart elderly care service resources under the line is mainly referred to Wang Yu et al. (2021) scholars related literature. So make the following assumptions:

H2: there is a positive correlation between the perceived quality of smart elderly care service and the satisfaction of smart elderly care service.

H2A: there is a positive correlation between the perceived quality of intelligent health pension service products and the satisfaction of smart elderly care service.

H2B: there is a positive correlation between the perceived quality of online smart elderly care service platform and the satisfaction of smart elderly care service.

H2C: there is a positive correlation between the perceived quality of offline smart elderly care service resources and the satisfaction of smart elderly care service.

(3) The influence of perceived ease of use on the satisfaction of smart elderly care services. Perceived ease of use refers to the degree to which the elderly subjectively believe that it is easy to accept smart elderly care services and use smart elderly care products and platforms. According to the results of Venkatesh (2003), the more people accept a new technology when it is relatively simple and can be fully learned without much effort. Scholar Zhang Yuan (2019) brought the perceived ease of use factor into the satisfaction model, and proved that there was a positive correlation between perceived ease of use and institutional smart elderly care service satisfaction through empirical research. The simpler the elderly feel, the higher the satisfaction will be. So make hypothesis H3: smart elderly care service perceived ease of use and smart elderly care service satisfaction is positively correlated.

(4) The influence of smart elderly care service satisfaction on continuous motivation. Continuous motivation refers to the willingness of the elderly to continue to use and recommend the use of smart elderly care services in the future. A large number of existing studies have shown that customer satisfaction has an important impact on continuous motivation. So make hypothesis H4: there is a positive correlation between smart elderly care service satisfaction and continuous motivation.

3.2. Design and Distribution of Questionnaires

3.2.1. Questionnaire Design

The questionnaire is divided into three parts, the first part is the brief introduction of the questionnaire and the description of the form; the second part is the basic characteristics of the survey object; the third part is the main part of the questionnaire. According to the relevant literature and combined with the actual situation, the author designs five latent variables (user expectation, perceived quality, perceived ease of use, satisfaction, continuity motivation). In the measurement method, the Likert scale was used to divide the answer options of each question into five items, and the values were 1-5 respectively.

3.2.2. Questionnaire Distribution

According to the present situation of the development of smart elderly care service in Chengdu, in order to make the research representative and extensive, four main urban areas are selected as the main research places, and the research objects are the elderly over 60 years old who have received smart elderly care service in these areas. In this paper, "accepted smart elderly care service" is defined as: at least once using intelligent health pension service products, and at least once using the smart elderly care service platform in the jurisdiction or dialing the 12349 hotline for service reservation and experience.

Considering the characteristics of the elderly group, the questionnaire is mainly distributed in various leisure and entertainment or medical and health care places. In order to reduce the reading obstacles of the elderly, the author uses the method of filling out the questionnaire to collect the information. A total of 200 questionnaires were sent out, 77 of which were not valid, 123 valid questionnaires were recovered, and the effective rate of the questionnaires was 61.5%.

3.3. Reliability and Validity Test

3.3.1. Reliability Analysis

In this study, reliability analysis was used to reflect the reliability of the questionnaire results and the reality of the tested variables. In this paper, the Cronbach's Alpha coefficient method is used to test. Cronbach coefficient, abbreviated as α value. When the α value is between 0 and 1, when $0.60 < \alpha < 0.65$, the measured variable data is not trusted and should not be used as much as possible; when $0.65 < \alpha < 0.70$, the measured variable data is more credible, which is the acceptance threshold; when $0.70 < \alpha < 0.80$, the measured variable data is quite credible; when $0.80 < \alpha < 0.90$, the measured variable data is especially credible. Therefore, the greater the α value, the higher the reliability of the questionnaire. The reliability test of all variables is carried out by using SPSS25.0 software, as shown in Table 1, and the $\alpha = 0.953$ is obtained, which shows that the reliability of the scale in the design of the questionnaire is quite high.

Table 1. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.953	0.953	28

3.3.2. Validity Analysis

(1) Content validity analysis. Content validity refers to the logic consistency between the item and the variable under test. In designing the questionnaire, this study read a large number of relevant literature at home and abroad, referred to the results of many scholars, adopted the opinions of relevant community leaders and experts and scholars, and combined with customer satisfaction theory and information technology service quality model to ensure that the items

and answers have logical consistency, so there is no problem in the content validity test of this questionnaire.

(2) Structural validity analysis. Structural validity refers to the ability of a test to measure the variables under test. In this paper, Bartlett's Test of Sphericity and KMO (Kaiser-Meyer-Olkin) tests were used to analyze the validity. The first method is to check the independence of variables in the model, and the latter method is to compare the number of PPMCC and partial relationship between the variables in the model. The test results are as shown in Table 2: the KMO value is 0.904, which is greater than 0.7, and the chi-square of Bartlet ≤ s spherical degree test is 3102.464, which reaches the significant level of 0.001, all of which meet the standard. Therefore, the structural validity of this questionnaire is good.

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.904
Bartlett's Test of Sphericity	Approximate chi-square	3102.464
	Degree of freedom	378
	Significance	0.000

4. Empirical Analysis

4.1. Descriptive Analysis

Through the statistics of 123 valid sample data, it can be seen that the proportion of female elderly people participating in the survey is high, reaching 75.61%. In the subsequent study, the proportion of male respondents should be increased appropriately. In terms of age, the proportion of elderly people aged 60-64 and 65-69 years old was 34.15% and 21.95%, respectively. Among the respondents, the majority of the respondents had a lower level of education: 26.2 per cent in junior high school, 23.58 per cent in primary school and 20.33 per cent illiterate or semi-illiterate. Only a few (7.32%) of the respondents were in poor health, and very few (1.63%) were in poor health. As far as the economic situation is concerned, the average monthly income is mainly distributed in 2000 yuan or more. In terms of living conditions, more than half of the elderly live alone or live with their partners. The average expectation of smart elderly care service for the elderly is between 3.46 and 3.56, which is in the upper middle level, and the standard deviation fluctuates between 0.898 and 0.952. The overall average score of perceived quality of online smart elderly care service platform and offline intelligent old-age service resources is higher than that of intelligent health pension service products. Among them, the average value of intelligent health pension products to meet the needs of emotional care is the lowest, which is 3.02, the average attitude of online smart elderly care service platform staff is good, and the average value of behavior norms is the highest, which is 3.85. The average score of other items is relatively close. The average values of the two items of perceived ease of use are 2.85 and 2.83, respectively, which are lower than those of other dimensions, which indicates that most elderly people find it difficult to use smart elderly care products and smart elderly care service platforms. The mean value of the four items in the satisfaction dimension fluctuated between 3.36 and 3.63, and the standard deviation fluctuated between 0.936 and 1.057. Among them, the satisfaction of elderly users with the types of services that smart elderly care can provide is the lowest, which is 3.36. Through the data analysis of the continuous motivation of the elderly to receive smart elderly care service and use the smart elderly care service platform, we can observe the willingness of the elderly users to use the smart elderly care service. The two items in the dimension have five different degrees of answers, and the mean value and the standard deviation are relatively close.

4.2. Analysis of Differences in Demographic Variables

Input the results of the questionnaire and process the data. The sex and living style of the subjects were tested by independent sample T test, the significance of which was P ≤ 0.156 and P ≤ 0.869, respectively. The age, educational level, health status and economic status of the subjects were analyzed by single factor variance analysis. The results showed that the significant P was 0.617, 0.166, 0.062 and 0.450, respectively. All P values were greater than 0.05, indicating that there was no significant impact on gender, living style, age, educational level, health status, economic status and satisfaction of smart elderly care services.

4.3. Correlation Analysis

Correlation analysis mainly studies the direction of correlation between two or more variables, as well as the degree of correlation. This section mainly studies the impact of user expectation, perceived quality and perceived ease of use on the satisfaction of smart elderly care services, as well as the impact of satisfaction on continuous motivation. With the help of SPSS25.0, the Pearson simple correlation coefficient commonly used in statistics is used for analysis.

According to the correlation analysis between user expectation and satisfaction, P value is 0.061, which is greater than 0.05. therefore, there is no significant correlation between user expectation and satisfaction. The Pearson coefficient between perceptual quality and satisfaction was 0.830, which could indicate that perceptual quality was positively correlated with satisfaction at the significant level (bilateral test). The Pearson coefficients between perceived quality of intelligent health pension service products, perceived quality of online smart elderly care service platform and perceived quality and satisfaction of offline smart elderly care service resources were 0.660, 0.779 and 0.827, respectively, which could indicate that there was a positive correlation and significant correlation between the three and satisfaction level (bilateral test). The Pearson coefficient between perceived ease of use and dependent variable satisfaction was 0.530, which could indicate that perceived ease of use was positively correlated with satisfaction at the significant level (bilateral test). The Pearson coefficient between satisfaction and continuity motivation was 0.830, which could indicate that there was a positive correlation between satisfaction and continuity motivation at the significant level (bilateral test) of satisfaction and continuity motivation.

4.4. Regression Analysis

Correlation analysis only shows that there is a correlation between perceived quality and satisfaction, perceived ease of use and satisfaction, satisfaction and continuity motivation, but there is no guarantee that when multiple variables in the model work together, this correlation still exists. In order to make up for this defect, regression analysis was further used to test the relationship between the variables in the model.

In this section, X1 and X2 are used to represent perceptual quality and perceptual ease of use, Q1, Q2 and Q3 are used to represent the perceived quality of intelligent health pension service products, the perceived quality of online smart elderly care service platform, the perceived quality of offline smart elderly care service resources, the satisfaction is expressed by Y, and the continuous motivation is represented by Z.

4.4.1. Regression Analysis of Influencing Factors and Satisfaction

(1) Regression analysis of X1, X2 and Y. As can be seen from the data in Table 3: $r^2 = 0.692$, the independent variables X1 and X2 can explain 69.2% of dependent variables Z, that is, 69.2% of satisfaction is due to perceptual quality and perceptual ease of use.

Table 3. Model summary[Z]

Model	R	Square	Adjusted R Square	Std. Error of the Estimate
1	0.832[a]	0.692	0.687	0.37587
A.Predictors: (Constant), X1, X2				

According to the data in Table 4, $P \leq 0.000$, $P < 0.05$, indicating that the regression equation has significance, and at least one of X1 and X2 can affect the dependent variable Y.

Table 4. ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	38.065	2	19.032	134.716	0.000[b]
1	Residual	16.953	120	0.141		
	Total	55.018	122			
A.DependentVariable:Y						
B.Predictors: (Constant), X1, X2						

According to the data in Table 5: VIF (X1)< 5, VIF (X2) < 5, it shows that there is no multiple collinearity between X1 and X2, which means that the result of this operation is accurate and reliable. P (X1) = 0.000, P< 0.05. the results showed that X1 could significantly affect Y, and B (X1) = 0.762, indicating that X1 had a significant positive effect on Y, that is, the higher the perceived quality, the higher the satisfaction, and P (X2) = 0.276, which indicated that X2 could not significantly affect Y.

Table 5. Coefficients[Y]

Model	Unstandardized coefficients		Standardized coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-0.186	0.180		-1.037	0.302		
X1	0.762	0.060	0.790	12.644	0.000	0.658	1.52
X2	0.038	0.035	0.068	1.095	0.276	0.658	1.52
A.DependentVariable:Y							

(2) Regression analysis of Q1, Q2, Q3 and Y. From the data in Table 6, we can see that $R^2 = 0.781$, which means that Q1, Q2 and Q3 can explain 78.1% of Y, that is, 78.1% of satisfaction is due to the perceived quality of intelligent health pension service products, the perceived quality of online smart elderly care service platform and the perceived quality of offline smart elderly care service resources.

Table 6. Model summary[Z]

Model	R	Square	Adjusted R Square	Std. Error of the Estimate
1	0.884[a]	0.781	0.776	0.31806
A.Predictors: (Constant), Q1, Q2, Q3				

According to the data in Table 7, $P \leq 0.000$, $P < 0.05$, indicating that the regression equation has significance, and at least one of the independent variables Q1, Q2 and Q3 can affect the dependent variable Y.

Table 7. ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	42.980	3	14.327	141.624	0.000[b]
1	Residual	12.038	119	0.101		
	Total	55.018	122			
		A.DependentVariable:Y				
		B.Predictors: (Constant), Q1, Q2, Q3				

According to the data in Table 8, the VIF values of Q1, Q2 and Q3 are all less than 5, which indicates that there is no multiple collinearity in the independent variables Q1, Q2 and Q3, which means that the results of this operation are accurate and reliable. P (Q1) = 0.001, P< 0.05. the results showed that the independent variable Q1 could significantly affect the dependent variable Y, and B (Q1) = 0.154, which indicated that the independent variable Q1 had a significant positive effect on dependent variable Y, that is, the higher the perceived quality of intelligent health pension service products, the higher the satisfaction; P (Q2) = 0.000, P< 0.05. the results showed that Q2 could significantly affect Y, and B (Q2) = 0.289, indicating that Q2 had a significant positive effect on Y, that is, the higher the perceived quality of online smart elderly care service platform, the higher the satisfaction; P (Q3) = 0.000, P< 0.05. the results showed that Q3 could significantly affect Y, and B (Q3) = 0.388, indicating that Q1 had a significant positive impact on Y, that is, the higher the perceived quality of offline smart elderly care service resources, the higher the satisfaction.

Table 8. Coefficients[Y]

Model	Unstandardized coefficients		Standardized coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-0.383	0.154		-2.484	0.014		
Q1	0.154	0.046	0.184	3.316	0.001	0.600	1.668
Q2	0.289	0.056	0.326	5.124	0.000	0.455	2.197
Q3	0.388	0.050	0.491	7.806	0.000	0.464	2.155
		A.DependentVariable: Q1,Q2,Q3					

Based on all the above analysis, the regression equation between independent variable and dependent variable is obtained as follows:

$$Y=-0.383+0.015*Q1+0.289*Q2+0.388*Q3. \tag{1}$$

4.4.2. Regression Analysis of Satisfaction and Continuity Motivation

As can be seen from the data in Table 9: r^2 = 0.689, the independent variable Y can explain 68.9% of the dependent variable Z, that is, 68.9% of the continuous motivation of elderly users is due to satisfaction.

Table 9. Model summary^Z

Model	R	Square	Adjusted R Square	Std. Error of the Estimate
1	0.830^a	0.689	0.686	0.51947
		A.Predictors: (Constant), Y		

According to the data in Table 10, P ≤ 0.000, P< 0.05, indicating that the regression equation has significance.

Table 10. ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	72.202	1	72.202	267.571	0.000^b
1	Residual	32.651	121	0.270		
	Total	104.854	122			
		A.DependentVariable:Z				
		B.Predictors: (Constant), Y				

According to the data in Table 11, P ≤ 0.000, less than 0.05, indicating that independent variable Y can significantly affect dependent variable Z, and B ≤ 1.146, indicating that independent variable Y has a significant positive effect on dependent variable Z, that is, the higher the satisfaction, the stronger the continuity motivation.

Table 11. Coefficients^Z

Model	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.561	0.191		2.940	0.004
Y	1.146	0.070	0.830	16.358	0.000
		a. DependentVariable:Z			

Based on all the above analysis, the regression equation between independent variable and dependent variable is obtained as follows:

$$Z \geq 0.561 \text{ x } 1.146 \text{ Y.} \tag{2}$$

4.5. Test Results of Research Assumptions

In the previous chapter, the author puts forward seven hypotheses of H1-H4, and tests them in this chapter. The hypotheses of H2, H2a, H2b, H2c and H4 are valid. In view of the fact that these two hypotheses should be established in theory, the results of H 1 test in this study may be contrary to the theory because of the short time span of the questionnaire. When the elderly group has already used wisdom to provide for the aged, it is inevitable that the expectation will carry the subjective feeling of the wisdom pension at this stage, so the authenticity of the data collected in fact remains to be discussed. The H3 test results may be contrary to the theory because the elderly think that the products and platforms are difficult to operate, but through interviews, we can know that they are willing to make corresponding efforts to enjoy smart elderly care services, coupled with the fact that they can seek help from community staff and the younger generation in the family in the event of operational obstacles, so this hypothesis is not valid.

4.6. Research Conclusions

4.6.1. Descriptive Analysis Conclusion

In the dimension of perceived quality, the perceived quality score of intelligent health pension service products is the lowest compared with the perceived quality of online smart elderly care service platform and offline smart elderly care service resources, which indicates that the quality of intelligent health pension service products needs to be improved. In the dimension of perceived quality of smart elderly care service platform online, the information protection of the platform and the network performance of the platform are low. In the future, we should pay attention to strengthening the protection of information security and the construction of network infrastructure. Perceived ease of use is the lowest of all the measured variables. It is generally believed that it is not easy for the elderly to operate and use smart elderly care systems and service aids, and to find and use the required services from the system. Generally speaking, satisfaction is at a medium level, which requires the joint efforts of all parties to improve smart elderly care services and improve the satisfaction of the elderly.

4.6.2. The Relationship between the three Influencing Factors and Satisfaction

In this study, the factors affecting satisfaction in smart elderly care service are divided into three dimensions: user expectation, perceived quality and perceived ease of use, in which perceptual quality is divided into perceptual quality of intelligent health pension service products, perceived quality of online smart elderly care service platform and perceived quality of offline smart elderly care service resources. Through empirical analysis, it is found that there is no correlation between user expectation and satisfaction of smart elderly care service; perceived ease of use is related to satisfaction, but the linear relationship between them is not true. Perceptual quality has a significant positive impact on the satisfaction of intelligent old-age service, among which the perceived quality of intelligent health pension service products, the perceived quality of online smart elderly care service platform and the perceived quality of offline smart elderly care service resources all have a significant positive impact on satisfaction, and smart elderly care service satisfaction also has a significant positive impact on the continuous motivation of the elderly.

4.6.3. The Relationship between Satisfaction and Continuous Motivation

According to the actual situation, this study renamed "customer loyalty" in the customer satisfaction model to "continuous motivation", mainly to explore the willingness of satisfaction for the elderly to continue to use smart elderly care services and recommend others to use smart elderly care services. According to the theoretical model and practical experience. This study holds that satisfaction will have a positive impact on continuous motivation, and the empirical test confirms this hypothesis, that is, the higher the satisfaction of the elderly with smart elderly care services, the more willing to continue to use it in the future and recommend it to others.

5. Suggestions on Improving Smart elderly care Services and Improving the Satisfaction of the Elderly

5.1. To Promote the Design and Development of Smart elderly care Products and Enrich the Supply of Practical Intelligent Old-Age Products

The progress of modern science and technology can promote the development of smart elderly care equipment, but there are still many limitations in the development of smart elderly care equipment in China at the present stage. First of all, the type of intelligent devices is relatively single, homogenization, low-end phenomenon is serious. Most of the existing smart elderly care equipment is to take care of the elderly in the aspects of daily life care, health management and intelligent monitoring, but the products in spiritual comfort are almost blank. This shows that

the development and design of smart elderly care products do not take into account the spiritual and cultural needs of elderly users as an independent "person". In the future design and research, efforts should be made to improve the "humanization" of smart elderly care products to meet the needs of emotional comfort for the elderly. In addition, according to the information learned by the research, some smart elderly care products in the ability to survive, detection accuracy and other aspects of the problem can be large or small, the elderly in the use of the desired results. Therefore, in the future design and development, we also need to pay special attention to the feedback problems, break through technical barriers, and build high-quality pension equipment. Secondly, there is still room for progress in the ageing of the product. Many smart elderly care products, especially those used in the care of daily life, such as intelligent speakers and intelligent curtains, are not designed according to the real needs of the elderly. In addition, many products for the elderly interface is complex, difficult to operate, is not practical. Therefore, product development and design need to accurately connect the needs of the elderly for the aged, combine cutting-edge technology with convenient operation, and develop smart elderly care products that are really suitable for the elderly.

5.2. Strengthening the Information Security Management of Smart elderly care Products and Online Smart elderly care Service Platform

At present, the vast majority of smart elderly care service platforms are registered using the real name system, elderly users will also be asked to provide more detailed personal information such as health data when booking certain services. And some smart elderly care products that can detect physiological indicators in real time store a large amount of data. At present, the smart elderly care services in China mainly rely on the Internet, cloud computing and other information technology. However, in view of the complexity and openness of the network environment, some personal information of the elderly is easy to appear many hidden dangers when it is transmitted and summarized into the corresponding database through the network. Some criminals will use improper means to steal the information and data of the elderly, thus committing fraud, personal identity theft and other criminal acts. The information base was originally established to provide services for the elderly more intelligently, but the leakage of privacy will hinder the development of smart elderly care. In addition, the elderly group instinctively doubt the reliability of new things, the problem of information security is also one of the factors that affect their satisfaction. In fact, the problem of information security not only exists in the elderly who receive smart elderly care services, but also is a common problem faced by people living in the era of "Internet +". Therefore, this requires the relevant departments to strengthen the construction of the rule of law system and severely punish criminals who steal information in order to obtain illegal economic income. In addition, it is necessary to strengthen the security of products and platforms in terms of technology, and solve this problem from the source. This requires the relevant staff to strengthen the management of product and platform information data, prevent and report to the parties and information base managers in the event of abnormal circumstances, but also require them to detect the system protection vulnerabilities and malicious theft of information in a timely manner, protect the attacks of illegal elements, ensure the technical security of the platform, and protect the information from leakage.

5.3. Strengthening the Construction of Network Infrastructure and Optimizing the Platform Response Mechanism

First of all, the government can break down the network barriers between operators, achieve the communication and coordination mechanism of information and data sharing, and form a joint force to improve the efficiency of network utilization. Secondly, we should increase the investment in Internet enterprises and urge the technological upgrading of Internet enterprises. In addition, the network infrastructure should be regularly repaired and maintained to ensure

its stable operation. At the same time, it is necessary to overcome the dilemma of the popularity of the Internet, gradually improve the penetration level of the Internet in the elderly population, improve and improve the network structure of the platform, accurately understand the needs of elderly users to build a service platform suitable for the elderly group, and form a complete online service network security system. On the other hand, it is necessary to improve the response mechanism of the smart elderly care service platform to ensure that the online reservation service and feedback problems of the elderly can be dealt with in a timely manner. If the elderly are in the process of using the smart elderly care service platform or receiving the smart elderly care service, If there are systematic problems or are not satisfied with the service but there are no feedback channels or have not been solved in time after feedback, it will have an impact on the overall satisfaction of elderly users with smart elderly care services to a certain extent, so it is necessary to set up special online platform staff and strengthen their service training. In a word, in order to promote the development of online smart elderly care service platform, it is necessary to consolidate the construction of infrastructure network facilities and form a useful technical security system. At the same time, we should also pay attention to improving the service quality of the platform, perfecting the problem feedback mechanism and demand response mechanism, so as to provide better services for the elderly.

5.4. Speeding Up the Rraining of Professionals in the Elderly Service Team

First of all, improve the professional level of employees. The government should encourage higher vocational colleges to set up relevant specialties, establish a perfect old-age service education and training system, and cultivate a number of professional talents who have a long history of elderly nursing and Internet technology for the development of intelligent old-age care. In addition to the study of theoretical courses in colleges and universities, the school should also regularly arrange for students to carry out the practice of vocational skills in professional institutions for the aged, so as to improve the professionalism and standard of their services. In addition to professional nursing staff, smart elderly care also needs high-tech talents such as software development, product research and development, information management and so on. The government should encourage the cooperation between colleges and universities with strong scientific research ability and smart elderly care enterprises to transport high-level talents for them. Secondly, we should enhance the professional identity of the employees of the smart elderly care service industry and improve the salary level. Domestic high-quality professionals are generally unwilling to enter the field of grass-roots pension services, the main reason is that the current pension service personnel pay and welfare treatment and social status is relatively low, resulting in their low sense of professional identity, industry talent wastage rate is higher. Accordingly, in order to retain professionals, it is necessary to improve their salary and welfare level and social status. We will establish and improve unhindered channels for the promotion of talents, improve the salary and welfare treatment of employees, create a harmonious working atmosphere, and enhance the sense of professional identity and dependence of employees. The mainstream media should vigorously publicize and recognize the advanced deeds of the employees in the old-age service industry, establish a good professional image, improve the social recognition of the pension service industry, so that these staff can obtain a positive social identity.

5.5. Promoting the Popularization of Intelligent Technology and Bridging the "Digital Divide" in the Elderly

First of all, cultivating the understanding and use of emerging technologies can not only help the elderly to receive and use smart elderly care services, but also promote the social integration of the elderly. On the one hand, the mainstream media should strengthen the propaganda of "new things" such as Internet technology, intelligent products and so on, in order to improve the recognition and attention of the elderly to these things, and change the

resistance of the elderly to information technology and smart elderly care in the imperceptible. On the other hand, the community should regularly train the elderly to improve the ability of the elderly to use the Internet and intelligent products, at least to ensure that the elderly learn to use the smart elderly care products and smart elderly care services that can be provided in the jurisdiction, so as to bridge the "digital divide" of the elderly from the source. In addition, training and counselling services should be set up within the community to assist older persons when they encounter problems with the use of smart products. Secondly, in the design and development of smart elderly care products, we should adhere to the principle of "taking the elderly as the center", according to the cognitive ability and use habits of the elderly population, to ensure the feasibility and ease of use of the relevant products. A truly practical smart elderly care product does not lie in the complexity of its system, nor in the comprehensiveness of its function, but in the actual needs of the elderly, abandoning the information and service function of quality and non-text, and the operation is simple and clear, easy to use. Finally, the government should increase the subsidy of smart elderly care services and smart elderly care products that need to be paid for use or installation, expand the scope of free distribution and supply of smart elderly care products and old-age services, reduce their consumption pressure, and then stimulate the full expression of their effective demand.

References

[1] Bai Mei. Intelligent old-age care: the pension system needs the top-level design. Jiangsu Business Theory, 2016 (03): 33-36.

[2] Ding Wenjun, Ding Rijia, Zhou Yueyu, Ouyang won. We will promote the construction of China's smart elderly care system. Macroeconomic Management, 2019 (05): 51-56.

[3] Jiang Senkai. The construction of ecological chain of smart elderly care under the new normal-the analytical framework and path choice based on the perspective of supply and demand. Journal of Shandong University of Finance and Economics, 2016, 28 (06): 104-113.

[4] Sui Dangchen, Peng Qingchao. Internet + living at home providing for the aged: intelligent home pension service model. Journal of Xinjiang normal University (philosophy and Social Sciences Edition), 2016, 37 (05): 128-135.

[5] Wen Haihong, Wang Yihuan. Analysis on the demand of Internet + 's Community Endowment Service based on individual differences. Social Security Research, 2019 (02): 40-48.

[6] Wu Yuxia, Wo NingLu. An Analysis of the Service Mode of Wisdom Endowment in China: a case study of Yangtze River Delta cities. Journal of Ningbo Institute of Engineering, 2016, 28 (03): 59-63.

[7] Xi Heng, Ren Xing, Zhai Shaoguo. Intelligent old-age care: innovation of pension services with information technology. Scientific Research on Aging, 2014, 2 (07): 12-20.

[8] Yu Xiao, Sun Yue. Internet + Endowment: a study on the Innovation and Development of Endowment Service Model in the New period. Journal of population, 2017, 39 (01): 58-66.DOI:10.16405/j.cnki.1004-129X.2017.01.006.

[9] Zhang Lei, Han Yongle. At present, the main mode, existing problems and countermeasures of smart elderly care in China. Social Security study, 2017 (02): 30-37

[10] Zheng Shibao. The Internet of things and wisdom provide for the aged. Television Technology, 2014, 38 (22): 24-27.

[11] Zhu Hailong. Intelligent old-age care: innovation and reflection on the mode of care for the elderly in China. Journal of Social Sciences, Hunan normal University, 2016, 45 (03): 68-73.

[12] Zuo Meiyun. The connotation, mode and opportunity of smart elderly care. China Public Security, 2014 (10): 48-50.

[13] Demiris George et al. Findings from a participatory evaluation of a smart home application for older adults.Technology and health care: official journal of the European Society for Engineering and Medicine, 2008, 16 (2): 111-8.

[14] FD Davis. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 1989, 13 (3): 319-340.

[15] Jan-Willem Van'et al. Virtual communities for elderly healthcare: user-based requirements elicitation. Int.J. J. Of Networking and Virtual Organisations, 2011, 9 (3): 214-232.

[16] Lemlouma T, Laborie S, Roose P. Toward a Context-Aware and Automatic Evaluation of Elderly Dependency in Smart Homes and Cities. World of Wireless, Mobile & Multimedia Networks. IEEE, 2013.

[17] Manuele Bonaccorsi et al. A Cloud Robotics Solution to Improve Social Assistive Robots for Active and Healthy Aging. International Journal of Social Robotics, 2016, 8 (3): 393-408.

[18] N.K. Suryadevara et al. Wireless sensors network based safe home to care elderly people: Behaviour detection. Sensors & Actuators: A. Physical, 2012, 186: 277283.

[19] Nazmiye Balta-Ozkan et al. Social barriers to the adoption of smart homes. Energy Policy, 2013, 63: 363-374.

[20] Rashidi Parisa and Mihailidis Alex. A survey on ambient-assisted living tools for older adults. . IEEE journal of biomedical and health informatics, 2013, 17 (3): 579-90.

[21] Sanna Sintonen and Mika Immonen. Telecare services for aging people: Assessment of critical factors influencing the adoption intention. Computers in Human Behavior, 2013, 29 (4): 1307-1317.

[22] Sanna Sintonen and Mika Immonen. Telecare services for aging people: Assessment of critical factors influencing the adoption intention. Computers in Human Behavior, 2013, 29 (4): 1307-1317.

[23] Sara J. Czaja and Chin Chin Lee. The impact of aging on access to technology. Universal Access in the Information Society, 2007, 5 (4): 341-349.

[24] Tijs Vandemeulebroucke and Bernadette Dierckx de Casterl é and Chris Gastmans. The use of care robots in aged care: A systematic review of argument-based ethics literature. Archives of Gerontology and Geriatrics, 2018, 74: 15-25.

[25] Viswanath Venkatesh et al. User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 2003, 27 (3): 425-478.