

Survey on the satisfaction of community elderly care service and its optimization strategies: A case study of S district in Shanghai



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ABSTRACT

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This study aims to understand the willingness and satisfaction of the elderly with smart elderly care services in Shanghai, and to put forward optimization suggestions for improving the quality of community elderly care services. Taking S District of Shanghai as an example, this paper adopts the methods of investigation and interview to comprehensively understand the construction of a community elderly care service system and the supply of smart elderly care services in S District of Shanghai. Through the questionnaire survey method, the basic information of the elderly in the community was understood, and problems such as the imbalance of supply and demand of the community elderly care service, the construction obstacles of the community smart elderly care service system, and the unsalable smart elderly care service products were analyzed. Relying on the concept and technical system of intelligent elderly care service, this paper is conducive to solving the core problems existing in the current Shanghai elderly care service system in the depth of matching supply and demand, helping to build the "Shanghai model" of smart elderly care service system, and providing a reference for China's elderly care service system. In this study, through practical investigation, the service supply mode, content, and effectiveness of community intelligent elderly care in S District were investigated. Through the questionnaire survey, we can understand the elderly's needs for smart elderly care services and service evaluation. The data collected is unique and novel.

Contribution/ Originality: This study examined the service supply mode, content, and effectiveness of intelligent community elderly care in S District through practical investigation. Utilizing a questionnaire survey, we gained insights into the requirements of older people for smart elderly care services and assessed service satisfaction. The gathered data is both distinctive and innovative.

1. INTRODUCTION

At present, Shanghai has entered an aging society in an all-round way. With the gradual disappearance of the demographic dividend and the gradual weakening of the traditional family care function, urban and rural communities are gradually facing huge pressure on elderly care. Although the development of community-smart elderly care services is also accelerating, it still cannot match the rapid growth of the demand for community elderly care services. Therefore, it is urgent to apply emerging scientific and technological means and new digital governance methods to optimize and explore new paths for the development of community-smart elderly care services.

Meanwhile, as the digital economy develops, the "sharing economy" is rapidly emerging in China. Under the background of the sharing economy, community care for the elderly can integrate the personal information of the elderly based on the sharing concept and sharing platform and explore the rich and diverse needs of the elderly. It can also improve the resource shortage of current community care for the elderly and play a significant role in improving the quality and efficiency of urban community home care in China.

1.1. Purposes

Through the study of the elderly's satisfaction with the supply of elderly care services, the author aims to find the existing problems in the community home care services in Shanghai and propose corresponding solutions. At the same time, this paper makes full use of modern science and technology, such as intelligent technology, Internet, big data, and cloud computing, to connect all resources of smart community home care services, design an "elderly care service ecosystem," and finally provide some valuable service innovation strategies and service model optimization suggestions for Shanghai smart community home care services.

2. LITERATURE REVIEW AND CONCEPT

With the gradual increase in disabled elderly people, intelligent elderly care has also become a major concern. Many scholars have carried out more in-depth research on it. These studies mainly discuss how to improve the mode and quality of elderly care services through information technology from the perspective of intelligent technology application.

Wang and Wang [1] proposed that the effective application of big data analysis is the future development of social elderly care business. The key support is to improve the technological content of social pension businesses while completely changing the businesses model, which can effectively improve the operating efficiency and quality of social pension business. Jin and Lin [2] believe that the essence of intelligent elderly care service is a new platform and new pattern formed by the interconnection mechanism with information technology as the core, so as to realize the overall change in providing high-quality elderly care services to the elderly.

Wei [3] proposed that the home-based smart elderly care service model refers to the application of home-based elderly care. The new management mode of modern information technology for home aged care services is an experience management mode formed in the process of practice and exploration.

Zhang [4] proposed the specific development mode of the "Internet + community elderly care" service model. He conducted an in-depth study on the development of "Internet +" for community elderly care, and proposed a smart community elderly care model.

Zou [5] believes that "Internet plus" can connect the life preferences of the elderly with big data. Big data is used to analyze the behavior habits and life trajectories of the elderly, so as to provide the elderly with the services they really need. This can improve the precision and intelligence of elderly care services. Liao and Qin [6] discussed it from the perspective of "Internet +" elderly care industry development. On the one hand, the combination of the Internet and the elderly care field can effectively improve the quality of elderly care services, and the development of the "Internet +" elderly care industry can promote employment and achieve a virtuous circle. Pan and Song [7] believes that "Internet +" elderly care is a way to solve the elderly care problem, and the integration of the two will become a new direction for the development of elderly care service model. Zhang and Hong [8] discussed the relationship between "Internet +" and elderly care from the perspective of the integration of elderly care service resources. Yu and Sun [9] and Geng and Wang [10] believes that "Internet plus" is a new driving force for reforming the field of elderly care, which is the improvement of efficiency and quality at the same time, and the innovation and subversion of the development of elderly care services.

Regarding the concept of community smart elderly care, Lu and Song [11] explores its concept from the perspective of information system, and believes that the "wisdom" of smart elderly care mainly refers to the

application of smart systems, including intelligent monitoring equipment to ensure the safety of the elderly, intelligent service system corresponding to the needs of the elderly and intelligent service platform for supply and demand coordination.

From the perspective of practice, [Zhu, et al. \[12\]](#) believes that smart elderly care is mainly compared with the traditional offline and artificial service model, which realizes the combination of online and offline, artificial and intelligent.

[Zhang \[13\]](#) believes that smart elderly care not only lies in the application of information systems, but also enriches the connection between the main body of the pension and the industry, so the smart pension should be identified as "relying on intelligent means to achieve the diversified and modern development of the pension service industry."

[Geng, et al. \[14\]](#) believe that smart elderly care refers to the way of elderly care services that rely on intelligent means to fully meet the needs of various subjects. Among them, "elderly care needs of various subjects" include the high-quality service needs of the elderly, the market expansion and profit needs of service providers, the needs of the government to promote social stability and economic development, and the interest demands of other coordinators.

3. RESEARCH METHODOLOGY

3.1. Research Design

This paper adopts the questionnaire survey method to collect data and designs the questionnaire. The questionnaire design is based on the reading characteristics of the elderly, and the design is concise and to the point, so as to avoid complicated and miscellaneous problems. SPSS 22.0 software was used for statistical analysis of the questionnaire data. The questionnaire divided the age into four segments: 50 to 60 years old, 61 to 70 years old, 71 to 80 years old, 81 years old and above; Demand consists of two aspects: purchasing ability and purchasing willingness, and needs without purchasing capacity cannot constitute insist. Therefore, the economic situation is an important factor affecting the demand for elderly care services.

3.2. Research Population

In this study, questionnaires were distributed from 4-6 major communities with a large number of elderly people in the S District of Shanghai, and questionnaires were distributed to elderly people over 60 years old. In this study, questionnaires were filled out anonymously, and those with a response rate of less than 90% were deleted. This study sent out a total of 530 questionnaires, 518 were recovered, with a recovery rate of 98%.

In this survey, 237 women accounted for 45.75% of the total sample, and 281 men accounted for 54.25% of the total sample. From the age structure, the 50-60 years accounted for 30.31% of the total effective sample, the elderly aged 61-70 years accounted for 46.91% of the total effective sample, the aged 71-80 years accounted for 14.09% of the total effective sample, and the elderly over 81 years accounted for 3.86% of the total effective sample. From the point of view of degree, primary school degrees and below accounted for 49.23% of the overall effective sample, junior high school degrees accounted for 28.96% of the overall effective sample, high school degrees (technical secondary school degrees) accounted for 11% of the overall effective sample, college degrees accounted for 5.98% of the overall effective sample, and undergraduates and above accounted for 4.83% of the overall effective sample. In general, the highly educated elderly population is relatively small.

3.3. Instruments

This paper adopts the questionnaire survey method to collect data, and designs an enterprise smart home elderly care service satisfaction questionnaire.

The questionnaire mainly includes 10 items of demographic information; the quality of smart home care services provided by enterprises, the elderly's demand for smart home care services, the elderly's satisfaction with smart home care services, etc. In the process of compiling the questionnaire, the factors of elderly at home are closely combined with the practical needs of the elderly, and the factors of the elderly at home are assessed from the aspects of gender, age, and educational background. The family factors of the elderly at home are evaluated according to their current marital status, living conditions, and raising children. To evaluate the health factors of the elderly according to their health status and self-care ability, monthly income was used to assess the economic factors of the elderly.

3.4. Reliability and Validity Test

The value of CITC (Corrected Item-Total Correlation) corresponding to each variable is above the standard value of 0.5, and the coefficient value from Cronbach α is also above the standard value of 0.7. Therefore, we have reason to believe that this scale exhibits good reliability and it's suitable for testing the model.

According to Table 1, the KMO (Kaiser-Meyer-Olkin) value of the quality of community home care service was 0.865, and the KMO value of the satisfaction of smart home care service was 0.788, both of which were greater than 0.7, and passed the Bartlett's spherical test. The minimum factor load of both of them is greater than the standard value of 0.5, indicating that they have a good degree of polymerization, and the cumulative contribution degree of both of them is greater than 0.7, indicating that they are suitable for factor analysis.

The CITC value for each variable is above the standard value of 0.5, and the coefficient value from Cronbach α is also above the standard value of 0.7.

Therefore, we have reason to believe that this scale has good reliability and can be used to test the model.

Table 1. Validity analysis of the variables.

Variable	The cumulative contribution of KMO			
Quality of community home care services provided	9	0.745	0.865	0.75
Pecuniary condition	3	0.704	0.788	0.78
Living condition	3	0.684	0.706	0.83
Health condition	3	0.791	0.821	0.79
Satisfaction with community home care services provided	9	0.632	0.798	0.78

3.5. Data Analysis

Questionnaire: All statistics are carried out by SPSS 22.0 statistical software, including the survey data input, collation, and statistical analysis of the basis. Interview: Data analysis uses content analysis to form a theoretical framework through continuous classification and enrichment of data.

4. RESULTS

Statistical analysis was performed using SPSS 22.0 software and the results of the basic descriptive statistical analysis are shown in Table 2:

4.1. Family Status

First, judging from whether the elderly have a spouse, the elderly accounted for 96.14%; judging from the living situation of the old man, living with a spouse and children, 17.18%, living with a spouse was 48.26%, living with their children accounted for 26.64%, the proportion of those living alone was 7.92%, thus it can be seen, the combined proportion of living alone and living with a spouse was 56.18%. This proportion significantly surpasses that of individuals who live with their children. The traditional family pension model relying on children has been difficult to adapt to the current pension needs of choice. The smart community home care model will become the

mainstream care model in the future. From the perspective of the number of children, 33.01% and 63.13 percent had more than two children. The proportion of childless people was 3.86%.

4.2. Health Status

For the elderly, the quality of the body is the core factor that directly affects the needs of smart community home care services for the elderly [15]. According to the survey data, of the 518 elderly, only 6.18% are 32; 54.44% have 1 to 3 chronic diseases and are able to take care of themselves; 34.75% suffer from 4 to 5 chronic diseases and can take care; and 4.63% are unable to take care of themselves. At the same time, from the perspective of the probability of various chronic diseases (see Table 2), the prevalence of hypertension and bone and joint diseases is relatively high, 61.8% and 65%, respectively. In addition, the probability of heart disease is also relatively high, 43.5%. For chronic diseases, it is well known that their treatment takes a long time; taking medicine on time is not easy to cure, but requires careful care. According to health data, the majority of the elderly need medical care. For the elderly who are completely unable to take care of themselves, comprehensive life care, 24-hour on-call services, and medical rehabilitation services are also needed. Therefore, the traditional home care model cannot provide comprehensive care services for the elderly's life and body, or it is difficult to provide effective help for the elderly if limited in energy, technology, and manpower.

Table 2. Simple descriptive information statistics.

Personal information		Number of people	Scale	Personal information		Number of people	Scale
Sex	Male	281	54.25%	Health condition	Very healthy (No disease)	32	6.18%
	Female	237	45.75%		General (1-3 chronic diseases, living can be fully self-care)	282	54.44%
Age	50-60	157	30.31%		Poor condition (4-5 chronic diseases, self-care ability, mild dependence)	180	34.75%
	61-70	243	46.91%		Very poor (More than 5 chronic diseases, unable to take care of themselves)	24	4.63%
	71-80	73	14.09%	Monthly gross income	CNY (Chinese Yuan) ¥3,000 and less	170	32.82%
	81 Above	45	8.69%		CNY ¥3,000 - <¥5,000	199	38.42%
Educational status	Primary school and below	255	49.23%		CNY ¥5,000 - <¥8,000	55	10.62%
	Junior middle school	150	28.96%		CNY ¥8,000 - <¥12,000	75	14.48%
	High school (Technical secondary school)	57	11%	CNY ¥12,000 and above	19	3.67%	
	junior college	31	5.98%	Economy source	Income from labor	239	46.14%
Bachelor degree or above	25	4.83%	Children to provide		300	57.92%	
Spouse	Have	498	96.14%		Retirement pension	328	63.32%
	Not have	20	3.86%		Government support or social funding	245	47.30%
Living condition	Living in pension institutions	89	17.18%	Personal endowment insurance	177	34.17%	
	Live with your spouse	250	48.26%	0	20	3.86%	
	Live with your children	138	26.64%	One	171	33.01%	
	Living alone	41	7.92%	Children	Two or more	327	63.13%

4.3. Economic Situation

Economic status is an indicator that can intuitively measure the quality of life of the elderly. In this paper, monthly income less than 3,000 yuan is considered low income, monthly income between 3000-12,000 yuan is considered middle income, and monthly income more than 12,000 yuan is considered high income. First of all, from the perspective of the monthly total income of the elderly, 3000 yuan or less is 30.82%, belonging to the low-income range; 3000-5000 yuan is 38.40%, 5000-70.62%, 7000-9000 yuan, and 3.67%. Secondly, from the perspective of the monthly income source of the elderly, 46.14% obtain the income from their own labor, 57.92% provide part of the income by their children, 63.32% receive a retirement pension, 47.3% receive it from the government or social support, and 34.17% have personal pension insurance. Through further investigation, it was found that the retirement pension of the elderly in most urban communities accounts for the majority of their monthly income and becomes the main economic source of their monthly income. The financial support provided by children for the elderly becomes the second part of their monthly income and is also a relatively important part. When letting the elderly evaluate their overall economic situation each month, most of the elderly (48%) think that their economic situation is relatively poor.

4.4. Analysis of the Overall Demand Status of Various Smart Community Home Care Services

In general, the majority of the elderly who choose community home care choose basic nursing services, professional nursing services, health care services, and rehabilitation guidance services, and the market demand for these services is relatively large. According to the results of the actual questionnaire data, 431 elderly people need basic nursing services (including general needs, needs, and needs), accounting for 83.20% of the total; 461, accounting for 89% of the total, 1; 479 need health care services, 92.50%; 473,91.3%; 462,89.2%; and 478 need psychological comfort services, accounting for 92.30%. It can be seen that the elderly's demand for various pension services is booming, and the market prospect of home care services in smart communities is very broad, see [Table 3](#).

Table 3. Demand degree of the elderly for enterprise community home care services.

Type	Non-essential	Generally, need	Need	Very much needed
Basic life care services	87(16.80%)	24(4.63%)	219(42.28%)	188(36.29%)
Professional nursing services	57(11%)	54(10.42%)	201(38.8%)	206(39.77%)
Health care services	39(7.53%)	72(13.90%)	222(42.86%)	185(35.71%)
Rehabilitation guidance services	45(8.69%)	66(12.74%)	228(44.02%)	179(34.56%)
Health consultation service	46(8.88%)	65(12.55%)	199(38.42%)	208(40.15%)
Psychological comfort service	40(7.72%)	71(13.71%)	239(46.14%)	168(32.43%)

Compared with the strong demand of the elderly for community home care services, the provision of various services in the communities where the elderly live is not very satisfactory, either the communities where the elderly live provide services but the services are poor, or they do not provide these services at all, and in other cases, the communities have services but due to poor information transmission, the elderly do not know the existence of such services. As the time passes, the physical condition of elderly individuals living alone gradually deteriorates, and their psychological well-being becomes increasingly fragile. Consequently, their reliance on essential services such as basic living care, professional nursing, health care, and psychological comfort services intensifies. The results of the questionnaire survey show that the elderly in smart homes have a high demand for smart home care services, but the degree of satisfaction with these needs is relatively low, and the proportion of service demand is relatively low, see [Table 4](#).

Table 4. Demand ratio and service provision ratio.

Service item	Requirement (%)	Supply (%)
Basic life care services	83.20	47.96
Professional nursing services	89	26.91
Health care services	92.50	39.83
Rehabilitation guidance services	91.30	36.51
Health consultation service	89.20	25.76
Psychological comfort service	92.30	31.49

4.5. Correlation Analysis of the Satisfaction Level

Select the quality of community home care service, economic status, living status, health status, and satisfaction of community home care service to make relevant analysis. Table 5 displays the correlation analysis coefficients for SPSS 22.

Table 5. Correlation analysis coefficient table.

Variable	1	2	3	4	5
1. The quality of community home care services	1				
2 Economic situation	0.507	1			
3 Living condition	0.333	0.754	1		
4 Health status	0.412	0.788**	0.751**	1	
5. Satisfaction with community home care services provided	0.362**	0.762*	0.702	0.766	1

Note: * indicates $P < 0.05$, ** $P < 0.01$.

According to Table 5, the correlation coefficient between the quality of community home care service and the satisfaction of the elderly with community home care service is 0.362, and the P value is less than 0.01, indicating a significant effect, indicating that the satisfaction is closely related to the quality of service. If the service is good, the satisfaction will be relatively high, the service is not good, then the satisfaction will be relatively low, which is also in line with the general law.

The correlation coefficient between the economic status of the elderly and the satisfaction degree of community home care service is 0.762, and the P-value is less than 0.05, indicating a significant effect, indicating a strong correlation between the economic strength of the elderly and their satisfaction degree of the quality of care service purchased.

5. CONCLUSION

Generally speaking, the higher the price of service, the better the quality of service provided, which is relatively better, correspondingly, the better the service, the higher the satisfaction of the elderly is [16]. Moreover, for the elderly with higher incomes, they are not sensitive to the pricing of services, and mainly pay attention to the quality of services. For people with low incomes, the main focus is on the cost performance of services. Generally speaking, the higher the cost and performance of services, the higher the satisfaction of elderly care services.

The correlation coefficient between living status and health status was 0.751, and the P value was less than 0.01, indicating a significant effect and indicating that the elderly would choose a suitable living mode according to their own health status. If the elderly are in poor physical condition and semi-disabled, they will be more inclined to choose a way of living that can help them, such as going to a nursing home or living with their children, so that their daily lives will be taken care of by others. If the elderly are healthy and able to take care of themselves, then in this case, the elderly will choose their preferred way of living, and will not be restricted to a specific way of living.

The correlation between economic status and health status of the elderly is also strong, with a correlation coefficient of 0.788 and a P value less than 0.01. It is easy to think that the higher the economic income of the elderly, the higher the medical and health investment will be. They will pay more attention to their daily physical

and mental health, regularly go to the hospital for check-ups, prevent problems before they occur, cure many diseases in the first signs of the time, and not delay too seriously before going to the hospital for treatment. Moreover, the daily physical health care of these elderly people is also better, because they are not worried about the economy, so they are more relaxed, so their health is naturally better.

5.1. Pay Attention to the Demand Matching of Smart Pension Products

Under the guidance of the concept of smart elderly care, the first problem facing the reform of the elderly care service system is the current imbalance between supply and demand [17]. It is necessary for the smart elderly care industry to first optimize the supply and demand structure and provide more diverse smart elderly care services. Many companies have developed new products suitable for the elderly, but the senility and wisdom of the products and services are not enough, and many devices are too complex and do not match the needs of the elderly. Enterprises should pay attention to the demand matching of smart pension products, first of all, enterprises should do a good job in the early stage of research, set up a professional needs assessment team, understand the needs of the elderly, from the elderly clothing, food, housing, transportation four aspects of demand research, understand the elderly pension dilemma, after in-depth investigation of the market, accurate classification of user types. Classify the needs of the elderly and the young according to the age group, define the age group and demand type of the service, formulate a distinct and self-contained smart elderly care service according to different needs, and provide corresponding smart elderly care service. Big data technology can collect the demands of the elderly for elderly care services, and then provide diversified smart elderly care services in a timely manner [18]. The demands of users at different levels can be responded to, so as to meet the diversified development requirements of smart elderly care services. For example, the elderly can provide smart home services, and the elderly can contact doctors in community hospitals through voice to consult about related medical problems. Secondly, smart elderly care needs to be supported by big data, develop a regular visit system, pay attention to the material and spiritual lives of the elderly, and develop the interaction system of relatives and friends, so that the elderly can interact closely with their relatives and friends through these systems, participate in various social activities, and then meet their psychological needs of returning to society. Let the elderly have a richer life, so as to avoid the damage caused by chronic diseases and various mental diseases [19]. At the same time, the R&D team should visit regularly, investigate and adjust the strategy in time according to the problems arising in the use process, adjust the supply and demand sides, and then achieve the expected results.

5.2. Provide Diversified Smart Elderly Care Service Products

Enterprises should increase their attention to innovative research and development work, actively introduce high-end technology such as big data technology, improve the intelligent level of decision-making, accurately grasp the demands of the elderly, and respond [20]. Enterprises and institutions in the industrial chain should conduct in-depth investigations of the elderly care market, and then grasp the heterogeneous demands of different groups for services and products, so as to scientifically plan research and development programs [21]. In addition, enterprises and institutions in the field of smart elderly care services should also truly establish a people-oriented concept and provide diverse and rich services based on the needs of the elderly. On the other hand, enterprises should continuously improve their information platforms and products [22]. At present, many communities have difficulties in information collection, and the operation difficulty of products remains high for a long time. Therefore, it is necessary for enterprises to enhance their research and development capabilities, solve these existing problems, and provide diversified pension services for the elderly with different needs from different age groups. At the same time, ensure the security of the elderly's personal information. It is necessary to increase research and development efforts, learn from the experience of developed countries, analyze the situation that the elderly may face in the process of operation and use of products from the perspective of the elderly, and use

technology to connect products and users, so that the purpose of science and technology to help the elderly can be truly realized [23].

5.3. Strengthening Digital Literacy among the Elderly

Improve the operation ability and cognitive ability of the elderly in various intelligent facilities, and then provide the intelligent elderly care.

The elderly have difficulties in using smart devices, so targeted education and training should be carried out according to the actual situation of the elderly, so that the elderly can master the operation and operation methods of the platform through learning, realize the smooth link between needs and technologies, and then truly respond to the demands of the elderly through science and technology [24]. In the product research and development process, the needs of the elderly should be accurately matched, so as to ensure the quality of services and carry out research and development of old-age projects. At the same time, we should really consider the physiological characteristics and spiritual needs of the elderly, and carry out product planning in a convenient and simple way as far as possible. At the same time, in the process of universal education, we cannot ignore the psychological counseling of the elderly. Only in this way can we ensure the enthusiasm and stable mentality of the elderly during the study.

5.4. Build A Comprehensive and Intelligent "Home + Community + Institution" Elderly Care Service System

5G mobile communication networks, cloud computing, the Internet of Things, intelligent elderly care terminals, etc., can be used to build a "smart elderly care" comprehensive information service platform and connect the elderly, communities, medical institutions, and medical personnel [25].

In terms of online interaction system, the contact between the elderly and their children, the elderly and the community, and the elderly and the institution is realized through various smart home technologies, and it is convenient to provide life services, emergency rescue services, and spiritual comfort services for the elderly [15]. Intelligent care systems, including environmental assisted living (AAL) systems, are configured in elderly care service institutions and community home care centers to achieve health management, service monitoring, operation management and other functions.

By developing and equipping them with various exclusive smart devices and smart terminals for the elderly, such as smart phones, one-click call devices, GPS (Global Positioning System) positioning, sensors, and integrating various exclusive services for the elderly on the APP (Application), including the elderly's life service system, medical security system, social system, and family interaction system.

5.5. Limitations and Outlook

Influenced by objective factors, there are certain defects in this study: First, community intelligent support is a new mode of old-age care that is still in the process of continuous improvement, and the final results of policy implementation cannot be fully grasped. Second, this study chooses a case study, mainly focusing on several communities in S district.

Due to the relatively small number of questionnaires issued, the final results may not meet the requirements for universality. It is hoped that in the follow-up study, the topic can be continuously discussed, and then contribute to the development of China's community smart elderly care service model.

Looking forward to the future, we can further expand the scope of cases and research, and examine other unexplored propositions, such as the sustainability of community smart elderly care.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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