

Research on the Impact of Smart Medical and Elderly Care Team Service Intervention on the Quality of Life of Elderly People Living at Home

Mengyao Li*

The University of New South Wales, Sydney 2210, Australia

**Author to whom correspondence should be addressed.*

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Abstract: *Aim:* To study and analyze the application effect of intervention by the smart medical and elderly care team service mode for the elderly living at home and its impact on their quality of life. *Method:* From January to December 2024, 100 cases were randomly selected from the elderly living at home in the jurisdiction of community health service institutions. The groups were divided by odd and even numbers, and the control group received conventional nursing services. The observation group adopted the service intervention of the smart medical and elderly care team. *Result:* The analysis of the effect of nursing services on the evaluation of quality of life and behavioral status. The comparison of scores shows that the improvement in the above dimensions in the observation group is definite ($P < 0.05$). The incidence of risk events was lower in the observation group between the two groups ($P < 0.05$). The data were compared. The satisfaction rate of nursing services in the observation group was significantly higher than that in the control group ($P < 0.05$). *Conclusion:* Implementing nursing services for the elderly at home, the service intervention of the smart medical and elderly care team, on the basis of promoting the improvement of their quality of life, helps adjust the behavioral state of the elderly and effectively avoid risk events, and has a significant nursing intervention effect.

Keywords: Smart medical and elderly care team; Service intervention; Elderly people living at home; Quality of life; Influence effect

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1. Introduction

With the advent of the era of population aging in the country, the daily situation of living alone at home has become the norm for most elderly people. Although most of the elderly in this situation have the ability to take care of themselves, due to factors such as chronic diseases and weak awareness of risk protection, risk events and acute disease attacks occur from time to time during their home stay. Besides causing damage to their physical health, it will also lead to pressure and burden in their family life ^[1]. The service intervention of the smart medical and

elderly care team is a nursing intervention plan constructed with improving the health of the elderly, preventing and controlling diseases, and enhancing their quality of life as the core. During implementation, intelligent devices are applied to intervene, manage, and guide the physical health level of the elderly, the control of chronic diseases they have, their self-care ability and awareness, etc. On the basis of maintaining the physical health of the elderly, it is helpful to manage the influence of factors such as diseases and living alone at home on their physical, mental health, and personal safety ^[2]. A total of 100 elderly people living at home in the areas under the jurisdiction of community health service institutions were included in this study. The implementation effect of providing service intervention to them through the smart medical and elderly care team approach was analyzed. The report is as follows.

2. Data and methods

2.1. General information

From January to December 2024, 100 cases were randomly selected from the elderly living at home in the jurisdiction of community health service institutions, and the groups were divided by odd and even numbers. In the control group, there were 28 elderly men and 22 elderly women, respectively, aged 65 to 89 years old, (74.85 ± 2.15) years old. Among them, there were 11 cases of hypertension, 10 cases of diabetes, 7 cases of hyperlipidemia, 12 cases of cardiovascular and cerebrovascular diseases, and 10 cases of other diseases. In the observation group, there were 26 male and 24 female elderly people, respectively, aged from 67 to 88 years old, (75.02 ± 2.48) years old. Among them, there were 12 cases of hypertension diseases, 11 cases of diabetes, 5 cases of hyperlipidemia, 13 cases of cardiovascular and cerebrovascular diseases, and 9 cases of other diseases. The data were consistent ($P > 0.05$).

2.2. Methods

The control group received conventional nursing services: Medical staff provided routine intervention for the elderly living at home through door-to-door services. The intervention was carried out in the form of traditional health management and guidance, including taking medicine as prescribed by doctors, health management, health guidance, and specialized nursing guidance. On this basis, inform the elderly to have regular follow-up visits and monitor indicators such as blood pressure and blood sugar in their daily lives. Continuously provide health guidance to the elderly living at home through methods such as telephone follow-ups and face-to-face visits.

2.3. Observation group of smart medical and elderly care team service intervention

- (1) The organization established a smart medical and elderly care team: Team members summarized the basic information of the elderly living at home in the jurisdiction of the community health service institution. After the summary, a service intervention file was established. Smart health medical and elderly care services were carried out with the help of intelligent terminal devices. During the planning stage of the service intervention plan, detailed plans were made for the service content, service items, and medical support. Then, provide professional and applicable measures for service intervention to the elderly living at home.
- (2) Health monitoring: The team regularly conducts health assessments for the elderly. They use smart devices to statistically analyze their blood sugar monitoring data and combine it with the data obtained from health wristwatches to comprehensively evaluate the physical condition and disease control of the elderly at each

stage. Based on this, they provide targeted health guidance during the face-to-face visits, such as adjusting diet and taking medication as prescribed by doctors. For those who provide remote medical services through mobile phones, videos, and other means, professional medical staff in the team will analyze and guide their actual situation. On this basis, keep in touch with the family members of the elderly and guide them to encourage them to do moderate exercise and maintain a regular schedule in their daily life.

- (3) Mental adjustment: Professional psychological counselors carry out psychological state intervention and adjustment for the elderly through online and offline channels. Combined with the indicator data measured by intelligent monitoring devices, they guide the elderly to participate in community activities and cultural and sports activities from an individual perspective. At the same time, they collaborate with community organizations to carry out group public welfare activities for the elderly, promoting the enrichment of their life content. Enhance their social interaction and interaction with others, thereby increasing the sense of social participation and belonging of the elderly.
- (4) Family support and education: Carry out care knowledge and skills training for family members of the elderly, strengthen family care capabilities, and promote joint participation. Regularly organize health knowledge education and publicity. To effectively enhance the health management awareness of the elderly and their families, physicians and senior nurses use the information platform to assess the mastery of health knowledge of the elderly and their families. Based on the assessment results, formulate personalized intervention plans. By integrating “Internet +” technology to build a “15-minute walk” smart elderly care service circle, online health education and remote consultation, home care, and other services can be implemented. On the basis of providing health education to the elderly and their families, convenient consultation and medical services can be provided for them, so that the service can effectively intervene in the elderly and maintain their physical and mental health.

2.4. Observation indicators

The SF-36 scale for quality of life was used to evaluate the dimensions of physiological function, physiological role, physical pain, general health status, vitality, social function, emotional role, and mental health of the elderly, with a total score of 100 points, to analyze the quality of life of the elderly.

The score sheet for mental state and social participation ability assesses aspects such as time orientation, aggressive behavior, person orientation, spatial orientation, financial management, memory, compulsive behavior, and depressive symptoms of the elderly. With a total score of 40 points, it analyzes the behavioral state of the elderly.

During the implementation of nursing intervention for the elderly, the number of cases with conditions such as falls, drug abuse, burns and scalds, and injuries from being hit by heavy objects was statistically analyzed to calculate the incidence of risk events.

After the completion of the nursing intervention, the satisfaction questionnaires for the elderly were distributed and filled out by the elderly themselves to conduct the satisfaction survey of nursing services.

2.5. Statistical processing

For measurement data presenting a normal distribution, the *t*-test was used; such data were presented as (Mean \pm SD). The count data were expressed by means of the χ^2 test as (n%). Data was processed using SPSS 25.0 statistical analysis software. When $P < 0.05$, it meant that there was a significant difference.

3. Result

3.1. Quality of life

The quality of life was better in the observation group between the two groups ($P < 0.05$), as shown in **Table 1**.

Table 1. Quality of life of elderly people living at home (points, Mean \pm SD)

Grouping	Case (n)	Physiological function		Physiological roles		Physical pain		General health condition	
		Before care	After care	Before care	After care	Before care	After care	Before care	After care
Control group	50	53.26 \pm 2.32	63.85 \pm 3.15	53.56 \pm 2.27	86.26 \pm 2.47	53.43 \pm 2.41	65.93 \pm 2.48	55.23 \pm 2.74	64.28 \pm 4.30
Observation group	50	52.90 \pm 3.15	68.69 \pm 2.71	53.01 \pm 3.21	87.30 \pm 2.57	53.50 \pm 2.29	87.13 \pm 3.09	55.32 \pm 2.85	84.96 \pm 2.15
<i>t</i>	-	0.6507	8.2362	0.9892	2.0681	0.1489	37.8348	0.1610	30.4167
<i>P</i>	-	0.5168	0.0000	0.3250	0.0417	0.8819	0.0000	0.8724	0.0000

Grouping	Case (n)	Vitality		Social function		Emotional function		Mental health	
		Before care	After care	Before care	After care	Before care	After care	Before care	After care
Control group	50	55.16 \pm 2.96	70.42 \pm 3.11	54.15 \pm 3.62	67.15 \pm 3.29	52.87 \pm 3.44	66.15 \pm 3.26	54.23 \pm 3.57	65.27 \pm 3.11
Observation group	50	55.22 \pm 3.08	86.93 \pm 4.20	54.03 \pm 3.58	86.32 \pm 2.80	53.04 \pm 3.50	86.15 \pm 2.30	54.17 \pm 3.62	85.74 \pm 2.60
<i>t</i>	-	0.0993	22.3385	0.1667	31.3764	0.2449	35.4467	0.0834	35.7072
<i>P</i>	-	0.9211	0.0000	0.8680	0.0000	0.8070	0.0000	0.9337	0.0000

3.2. Behavioral status

The comparison of the scale evaluation scores shows that the improvement of behavioral status in the observation group was better than that in the control group after nursing ($P < 0.05$), as shown in **Table 2**.

Table 2. Behavioral status of elderly people living at home (points, Mean \pm SD)

Grouping	Case (n)	Time orientation		Aggressive behaviour		Character orientation		Spatial orientation	
		Before care	After care	Before care	After care	Before care	After care	Before care	After care
Control group	50	3.03 \pm 0.21	1.85 \pm 0.52	2.63 \pm 0.14	1.62 \pm 0.11	2.21 \pm 0.18	1.69 \pm 0.18	2.07 \pm 0.24	1.83 \pm 0.15
Observation group	50	3.10 \pm 0.18	0.74 \pm 0.11	2.59 \pm 0.18	0.68 \pm 0.05	2.24 \pm 0.20	0.65 \pm 0.11	2.12 \pm 0.26	0.79 \pm 0.20
<i>t</i>	-	1.7896	14.7672	1.2403	55.0093	0.7884	34.8609	0.9992	29.4156
<i>P</i>	-	0.0766	0.0000	0.2178	0.0000	0.4324	0.0000	0.3202	0.0000

Grouping	Case (n)	Financial management		Memory		Compulsive behaviour		Depressive symptoms	
		Before care	After care	Before care	After care	Before care	After care	Before care	After care
Control group	50	3.14 \pm 0.24	1.59 \pm 0.20	3.05 \pm 0.16	1.68 \pm 0.14	2.83 \pm 0.23	1.84 \pm 0.18	2.52 \pm 0.13	1.71 \pm 0.20
Observation group	50	3.19 \pm 0.21	0.68 \pm 0.13	3.08 \pm 0.22	0.72 \pm 0.10	2.74 \pm 0.26	0.62 \pm 0.15	2.47 \pm 0.16	0.70 \pm 0.14
<i>t</i>	-	1.1087	26.9755	0.7798	39.4558	1.8333	36.8179	1.7150	29.2539
<i>P</i>	-	0.2703	0.0000	0.4374	0.0000	0.0698	0.0000	0.0895	0.0000

3.3. Incidence of risk events

The incidence of risk events in the observation group was low between the two groups ($P < 0.05$), as shown in **Table 3**.

Table 3. Incidence of risk events among elderly people living at home (n%)

Grouping	Case (n)	Falls	Drug abuse	Burns and scalds	Injuries from heavy objects being hit	Incidence rate
Control group	50	2(4.00%)	2(4.00%)	1(2.00%)	2(4.00%)	7(14.00%)
Observation group	50	0(0.00%)	1(2.00%)	0(0.00%)	0(0.00%)	1(2.00%)
χ^2	-	-	-	-	-	4.8913
<i>P</i>	-	-	-	-	-	0.0270

3.4. Satisfaction with nursing services

After the investigation, the observation group has a good satisfaction with the nursing service ($P < 0.05$), as shown in **Table 4**.

Table 4. Satisfaction with home-based elderly care services (n%)

Grouping	Case (n)	Very satisfied	Satisfied	Generally satisfied	Dissatisfied	Satisfied rate
Control group	50	12(24.00%)	14(28.00%)	15(30.00%)	9(18.00%)	41(82.00%)
Observation group	50	14(24.00%)	15(30.00%)	19(38.00%)	2(4.00%)	48(96.00%)
χ^2	-	-	-	-	-	5.0051
<i>P</i>	-	-	-	-	-	0.0253

4. Discussion

Whether the physical and mental health of the elderly is good is closely related to their quality of life. Through the observation of previous patients, the elderly are the main group affected by chronic diseases. The occurrence of chronic diseases will have an impact on the physical and mental health of the elderly. In addition, there are no specific cure measures at present, and most elderly people hold a negative attitude towards their own illness. This, based on making it impossible to effectively control their condition, will also cause the rapid development of their condition. While promoting the decline in the quality of life of the elderly themselves, it will also lead to pressure on their family life and economic burden ^[3].

The smart medical and elderly care team service intervention, as a current health management and elderly care service model with significant innovation and advancement, is a management intervention approach constructed based on today's advanced information technology and medical resource sharing platforms. It features more convenient communication and good timeliness in medical services. From the perspective of application value, the smart medical and elderly care team conducts management intervention by leveraging technologies such as the Internet of Things, big data, and artificial intelligence. Besides breaking the limitations of time and space on medical services, it can effectively achieve remote health monitoring and management. After implementation, the service intervention of the smart medical and elderly care team builds a convenient service circle, improving the utilization rate of resources. More convenient and efficient professional services can be provided for those with demands for medical services and health management ^[4-5]. Based on this, for the elderly living at home, service intervention is implemented in the form of a smart medical and elderly care team. Multi-disciplinary personnel such as doctors, nurses, rehabilitation therapists, nutritionists, and psychological counselors conduct remote health monitoring, health guidance, and management for them through offline and online channels. Based on providing

continuous health services for them, the care needs of the elderly will be truly met. Furthermore, after intervention, on the basis of maintaining the physical and mental health of the elderly, effective guidance can also be provided on their awareness of disease attention and disease prevention and control concepts, thereby laying a good foundation for improving the quality of life of the elderly living at home^[6].

In conclusion, the implementation of home-based elderly care service intervention and smart medical and elderly care team service intervention can have a positive impact on improving their quality of life. It is recommended to promote it.

Disclosure statement

The author declares no conflict of interest.

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