Current Status of Preliminary Cognitive Screening Services in Community Dementia Service Centers in Nanjing City (Post-Print)

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Abstract

Background The current national policy places high emphasis on the development of early diagnosis and treatment services for dementia, while community-based preliminary cognitive screening constitutes the foundation of the dementia early diagnosis and treatment service system and represents the primary gateway in the cognitive screening process; its screening quality directly impacts the brain health status of older adults and the overall efficiency of cognitive screening. Objective To understand the current status of preliminary cognitive screening services in Nanjing and provide references for promoting high-quality construction of dementia service centers. Methods From December 2023 to August 2024, all community dementia service centers in Nanjing were visited, with 12 institutions providing early dementia screening services for surrounding elderly populations selected as research subjects. A self-designed institutional survey questionnaire was used to collect basic information about the institutions and their implementation of preliminary cognitive screening services. Results Regarding institutional basic information: 9 (75.0%) institutions operated under the umbrella of elderly care service organizations; the average duration of preliminary cognitive screening services among the 12 institutions was $(16\$\pm6)months; theaverageannualscreeningvolumewas(245\pm\$235)$ person-times; among the configured preliminary cognitive screening personnel, nurses accounted for the highest proportion [36.8% (21/57)], with only 4 (33.3%) institutions simultaneously employing both physicians and nurses. Regarding service content: 2 (16.7%) institutions adopted diversified screening methods for cognitive assessment, with 3–7 types of early cognitive intervention services available; 4 (33.3%) institutions had established cooperative institutional networks, 5 (41.7%) planned to establish such networks, while 2 (16.7%) still limited their screening scope to their own residential communities; 8 (66.7%)

institutions provided early intervention services, and 9 (75.0%) provided early follow-up services. Regarding service implementation effectiveness: the average annual detection rate of high-risk dementia populations among the 12 institutions was 28.85%, the average annual early intervention rate for dementia among 8 institutions was 60.97%, and the average annual early follow-up rate for dementia among 9 institutions was 70.94%. Regarding funding sources: funds for preliminary cognitive screening projects in all 12 institutions came from institutional self-funding or government project subsidies. Conclusion The preliminary cognitive screening service system at community dementia service centers in Nanjing has achieved initial scale, and early dementia prevention and control have yielded certain results. However, problems exist including incomplete staffing, non-standardized preliminary cognitive screening services, slow progress in preliminary cognitive screening services, and insufficient funding support. It remains necessary to improve the cognitive prevention and control mechanism, strengthen cognitive prevention and control safeguards, and enhance social support to promote the construction and standardized management of the dementia service network.

Full Text

The Current Status of Initial Cognitive Screening Services in Community-based Cognitive Services Centers in Nanjing, China

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Abstract

Background: Currently, the state attaches great importance to the development of early diagnosis and treatment services for cognitive disorders. Preliminary community cognitive screening serves as the foundation of the early diagnosis and treatment service system for cognitive disorders and represents the primary barrier in the cognitive screening process. The quality of screening directly impacts the brain health level of older adults and the overall efficiency of cognitive screening.

Objective: To understand the current status of preliminary cognitive screening services in Nanjing and provide a reference for promoting the high-quality construction of cognitive disorder service centers.

Methods: From December 2023 to August 2024, we conducted site visits to

all community cognitive service centers in Nanjing. Twelve institutions that provided early screening services for dementia among the surrounding elderly population were selected as research subjects. Using a self-designed institutional survey form developed by our research team, we collected data on basic institutional information and the implementation status of preliminary cognitive screening services.

Results: Regarding basic institutional characteristics: 75.0% (9/12) of the institutions operated based on elderly service organizations; the average duration of cognitive preliminary screening services was (16$\pm$6)$months$;$theaverageannualscreeningvolumewas$(245$\pm$$235 person-times. Among screening personnel, nurses accounted for the highest proportion [36.8% (21/57)], and only 33.3% (4/12) of institutions were staffed with both physicians and nurses. Regarding service content: 16.7% (2/12) of institutions adopted diversified screening methods; the types of cognitive early intervention services ranged from 3 to 7; 33.3% (4/12) of institutions had established cooperative institution networks, 41.7% (5/12) planned to establish such networks, while 16.7% (2/12) limited their screening scope to their own residential communities; 66.7% (8/12) of institutions provided early intervention services, and 75.0% (9/12) provided early follow-up services. Regarding service outcomes: the average annual screening detection rate for high-risk cognitive disorder groups across the 12 institutions was 28.85%; the average annual early intervention rate among the 8 institutions providing such services was 60.97%; and the average annual early follow-up rate among the 9 institutions providing follow-up services was 70.94%. Regarding funding sources: all 12 institutions relied on institutional funds or government project subsidies for their cognitive preliminary screening programs.

Conclusion: The cognitive preliminary screening service system in Nanjing' s community cognitive service centers has begun to take shape, and early prevention and control of cognitive disorders have achieved certain results. However, problems remain, including incomplete staffing, non-standardized cognitive preliminary screening services, slow progress in service implementation, and insufficient financial guarantees. It is still necessary to improve cognitive prevention and control mechanisms, strengthen cognitive prevention and control guarantees, and enhance social support to promote the construction and standardized management of the cognitive disorder service network.

Keywords: Community cognitive service center; Cognition disorders; Screening; Community health services; Delivery of health care; Health workforce

Introduction

With the acceleration of population aging, the incidence of dementia, primarily Alzheimer' s disease, continues to increase, seriously threatening the health and quality of life of older adults. The General Office of the National Health Commission issued the "Notice on Launching the Dementia Prevention and

Promotion Action (2023-2025)," which identifies early cognitive screening, early detection, and early intervention as important measures to reduce and delay the onset of dementia [1]. Expert consensus indicates that cognitive function screening should follow a hierarchical referral mechanism, with primary-level medical and health institutions responsible for preliminary cognitive screening to conduct large-scale rapid screening, serving as the primary gateway to systematic early screening for dementia [2-3]. As one of China' s pilot regions for early dementia screening, Nanjing has continuously strengthened the construction of its dementia service network since the implementation of the "Nanjing Community Elderly Cognitive Disorder Service Center Construction Action Plan" (hereinafter referred to as the "Action Plan"), and has gradually established 29 community cognitive disorder service centers as of January 12, 2024 [4].

Nanjing' s community cognitive disorder service centers provide cognitive function assessment and professional intervention services for older adults, effectively maintaining and improving their cognitive function. However, no relevant reports have been published regarding the service coverage of each center, whether they fulfill their corresponding preliminary cognitive screening functions, or the specific content of their preliminary cognitive screening services. This study conducted a cross-sectional survey of Nanjing' s community cognitive disorder service centers to understand the current status of their preliminary screening services and provide recommendations and evaluation criteria for the high-quality construction of community cognitive disorder service centers.

1.1 Study Subjects

Community cognitive disorder service centers only conduct preliminary cognitive screening for older adults to assess their risk of dementia and cannot provide medical diagnoses. From December 2023 to August 2024, we conducted field investigations of 29 community cognitive disorder service centers included in Nanjing' s 2023 government elderly care service projects, selecting 12 institutions that provided early dementia screening services for the surrounding elderly population as research subjects. This study was approved by the Ethics Review Committee of Nanjing Hospital of Chinese Medicine (approval number: KY2022004).

1.2 Survey Tools

The institutional survey form was self-designed by our research team. After reviewing literature and conducting preliminary community visits, we developed an initial draft. The content was repeatedly revised and adjusted through expert consultation and small-scale pilot surveys to finalize the formal survey form. The survey included: (1) Basic institutional information, such as region, operating unit, service positioning, coverage area of the preliminary cognitive screening project, duration of preliminary cognitive screening services, annual screening volume, and staffing for preliminary cognitive screening services. (2) Implementation status of preliminary cognitive screening services, covering service con-

tent, service outcomes, service fee payment, and funding guarantees. Service content indicators involved target population, screening frequency, screening type, screening technology, screening tools, early intervention service implementation, early follow-up service implementation, and cooperative institution network establishment. Service outcome indicators involved the number of high-risk individuals identified, actual number of participants in early intervention, and actual number of early follow-ups, with calculations of corresponding annual screening detection rates for high-risk groups, annual early intervention rates, and annual early follow-up rates. Service fee payment referred to whether older adults in the sample institutions' surrounding areas needed to pay out-of-pocket for preliminary cognitive screening services.

The sample institutions defined high-risk cognitive disorder groups based on their screening criteria as individuals with Montreal Cognitive Assessment (MoCA) total scores of 19-25 points or Mini-Mental State Examination (MMSE) total scores of 18-26 points for the illiterate group, 21-26 points for the primary school group, and 23-26 points for the middle school and above group [5-6]. Since community cognitive disorder service centers only conduct preliminary screening and cannot provide medical diagnoses, this study used the number of high-risk individuals identified as one of the screening outcome indicators.

1.3 Data Collection and Quality Control

Trained research team members served as investigators for data collection. Before the survey, they explained the purpose of the study to the directors of the cognitive disorder service centers and obtained their informed consent. During the survey, data on basic institutional information and service implementation were collected from center directors and preliminary cognitive screening service staff through a combination of interviewer-administered and self-administered methods. After the survey, data were double-entered and cross-checked. Quality control methods included: (1) Reconfirming and correcting missing data, non-standard answers, and data with obvious logical problems; all data were entered only after verification. (2) Excluding survey forms with missing data on preliminary cognitive screening service outcomes.

1.4 Statistical Methods

The 12 institutions were coded A through L. Excel software was used for data entry and organization, and SPSS 23.0 statistical software was used for descriptive statistical analysis. Count data were expressed as relative numbers, and normally distributed measurement data were expressed as ($\bar{x}\pm s$).

Results

2.1 Basic Characteristics of Institutions

Among the 12 community cognitive disorder service centers, 9 (75.0%) were operated by elderly service organizations and 3 (25.0%) by communities. All centers included dementia knowledge education and preliminary cognitive screening in their service positioning, with some also involving early cognitive intervention, dementia cycle care, and day care for elderly individuals with dementia. The average coverage area of preliminary cognitive screening project zones was (418$\pm$190)m^{2}.$The average duration of preliminary cognitive screening services was (16\pm6) months, and the a$ person-times. A total of 57 preliminary cognitive screening service personnel were configured, with nurses accounting for the highest proportion [36.8% (21/57)], and rehabilitation therapists and administrative assistants accounting for the lowest [1.8% (1/57) each]. Only 33.3% (4/12) of institutions were staffed with both physicians and nurses .

2.2 Preliminary Cognitive Screening Service Content

Regarding target populations, 2 (16.7%) institutions limited their screening scope to their own residential communities. For preliminary cognitive screening, 2 (16.7%) institutions adopted diversified screening methods combining proactive and opportunistic screening, while another 2 (16.7%) used diversified methods combining traditional scale screening with digital cognitive screening. Six (50.0%) institutions used only a single cognitive assessment scale as their screening tool. For continuity of care, 8 (66.7%) institutions provided early intervention services, and 9 (75.0%) provided early follow-up services. Five (41.7%) institutions planned to establish cooperative institution networks .

2.3 Outcomes of Preliminary Cognitive Screening Services

The annual screening detection rate for high-risk cognitive disorder groups across the 12 institutions ranged from 5.70% to 70.0%, with an average of 28.85%. Among the 8 institutions providing early intervention services, the annual early intervention rate ranged from 22.97% to 100.00%, with an average of 60.97%. Among the 9 institutions providing early follow-up services, the annual early follow-up rate ranged from 31.25% to 100.00%, with an average of 70.94% .

2.4 Service Fees and Funding Guarantees for Preliminary Cognitive Screening

All 12 institutions provided preliminary cognitive screening services free of charge. Among them, 4 (33.3%) institutions received funding from government project subsidies, 3 (25.0%) had to bear partial project costs themselves, and 8 (66.7%) had to fully bear project costs themselves.

Discussion

3.1 Preliminary Cognitive Screening Service Infrastructure Has Begun to Take Shape, but Staffing Needs Improvement

Nanjing has established the development of community cognitive disorder service centers as a municipal "people' s livelihood project," with clear construction requirements that achieve full coverage of administrative districts and the Jiangbei New Area, capable of providing cognitive screening and care services for over 10,000 older adults citywide [7]. The survey showed that the average coverage area of preliminary cognitive screening project zones in the sample institutions was 418 m^2, with nine functional areas established, meeting construction standards [7]. The average annual screening volume of sample institutions reached 245.33 person-times, which is lower than the indicator of "500 people per pilot community annually" in the "Jiangsu Province Elderly Cognitive Disorder (Dementia) Screening and Intervention Pilot Program" (hereinafter referred to as the "Pilot Program") [8]. However, the average duration of preliminary cognitive screening services was 16 months, suggesting that the relatively short implementation time and the fact that various service systems remain in the pilot exploration stage may account for this difference. Additionally, 9 sample institutions were operated by elderly service organizations, indicating that operating preliminary cognitive screening services based on professional elderly service organizations has become a major trend. Shanghai has initially established an elderly cognitive disorder prevention and control model, and its local standard "Guidelines for the Construction of Elderly Cognitive Disorder-Friendly Communities" (hereinafter referred to as the "Construction Guidelines") points out that models combining community-embedded elderly care with cognitive disorder care should be explored, or cognitive disorder service zones should be established within elderly care institutions in communities to provide professional care services, affirming the operational model of sample institutions seeking professional cooperation to improve service quality [9].

Furthermore, the number of preliminary cognitive screening staff in sample institutions ranged from 2 to 10, with diverse occupational categories including physicians, nurses, rehabilitation therapists, etc., indicating that diversified occupational staffing has begun to take shape. Nurses accounted for the highest proportion at 36.8%. Multiple studies have pointed out that nurses play a primary management and coordination role in dementia service teams and are indispensable in dementia screening practice [10-11], highlighting the importance of recognizing nurses as the backbone of dementia services. Additionally, social workers, nursing assistants, and volunteers accounted for 50.9% of staff. Shanghai' s experience in preventing and controlling elderly cognitive disorders demonstrates that dementia-friendly teams composed of social workers and volunteers can reduce community human resource loads and facilitate the sustainable, flexible, and whole-process advancement of projects [12], providing insight for other newly established cognitive disorder service centers to attach great importance to the power of dementia-friendly teams. The Fujian Provincial

local standard "Specifications for Community Care Services for Elderly Individuals with Cognitive Disorders" states that professional cognitive disorder care teams should include, but not be limited to, physicians, rehabilitation therapists, community nurses, and nursing assistants [11]. The Jiangxi Provincial local standard "Guidelines for Screening and Intervention of Mild Cognitive Impairment in Older Adults" points out that community health service centers should be equipped with at least one health management team with professional knowledge and skills in cognitive function screening and intervention [13]. These standards indicate that the staffing configuration for preliminary cognitive screening in sample institutions still needs further optimization to provide high-quality and efficient cognitive screening and intervention services.

3.2 Preliminary Cognitive Screening Service System Has Initially Formed, but Service Standardization Needs Strengthening

The preliminary cognitive screening service system includes cognitive education and knowledge popularization, cognitive screening, early intervention, and cognitive follow-up. Screening methods can be divided into regular screening and normalized screening based on frequency [14]. Currently, 1 sample institution has adopted a combination of regular and normalized screening methods, which complement each other to provide guarantees for brain health management. Based on organizational form, screening methods can be divided into proactive screening and opportunistic screening [15]. The survey showed that 3 sample institutions have adopted a combination of proactive and opportunistic screening methods for preliminary cognitive screening. The effectiveness of diversified cognitive screening methods has been confirmed in Shanghai' s cognitive pilot model, which enriches screening content, improves older adults' participation, and facilitates medical diagnosis and two-way referrals for the elderly population [12]. Based on screening tools, screening methods can be divided into traditional scale screening and digital cognitive screening. Currently, 2 sample institutions have adopted a combination of traditional scale and digital cognitive screening. Traditional scales remain the basic means of determining cognitive levels [3], but they have shortcomings such as high human resource consumption, difficulty in data sharing, and monotonous assessment processes. Digital cognitive screening can reduce human resource burdens, enable rapid screening, and increase older adults' interest in participation, but its screening accuracy still requires assistance from scales [2]. The combination and continuous improvement of both methods will achieve rapid and effective dementia screening while reducing community human resource burdens. This indicates that a diversified cognitive screening model has initially formed in the sample region and is worthy of further promotion. Regarding continuity of care after screening, a total of 8 sample institutions provide early intervention services with 3-7 types, enabling diversified interventions for high-risk cognitive groups. Nine sample institutions provide cognitive monitoring and follow-up services for high-risk groups identified through preliminary screening. These findings demonstrate that the preliminary cognitive screening service system in the sample region has

initially formed.

However, in-depth analysis reveals that the standardization of preliminary cognitive screening services in the sample region still needs strengthening. First, 2 sample institutions have set upper age limits for screening at 90 and 80 years, respectively. The Construction Guidelines state that priority should be given to promoting cognitive screening for older elderly individuals [9], while epidemiological research indicates that the prevalence of preclinical dementia in China rises sharply in the 70-80 age group, with dementia prevalence peaking in the 80-85 age group [16]. This suggests that the upper age limits for screening in sample institutions need reconsideration. Second, the scope of cognitive screening services needs expansion. The Construction Guidelines state that each street should establish an elderly cognitive disorder support center that is fully open to the community [9]. Five sample institutions limited their service scope within communities, unable to cover street-level areas, which restricts service scope and is not conducive to cognitive education. Third, screening standards need to be unified and standardized. Sample institutions showed large differences in cognitive screening standards and assessment tools, failing to meet the requirements of "unified assessment, unified protocols, unified service processes, and unified service content" in the Action Plan [7], possibly due to the lack of relevant standards and guidelines for reference. Additionally, 6 sample institutions used only a single scale for cognitive assessment, making it difficult to ensure high accuracy [2] and affecting the operational efficiency and service quality of cognitive screening services. Fourth, the network of cooperative institutions for dementia needs to be established. The Notice states that pilot regions should explore the establishment of a dementia prevention and treatment service network to provide comprehensive and continuous dementia prevention and treatment services for older adults [1]. In the sample region, 4 institutions have established cooperative institution networks, but 3 still have no plans to do so. Failure to establish such networks will hinder the formation of an integrated dementia prevention and control system combining "screening-care+training."

3.3 Slow Progress in Preliminary Cognitive Screening Services and Insufficient Funding Guarantees

The average annual screening detection rate for high-risk dementia groups in sample institutions was 28.85%, indicating a potential demand for preliminary cognitive screening services among older adults in the sample region. However, the average annual number of individuals receiving early intervention in sample institutions was 21.87, slightly lower than the indicator of "25 people per pilot community annually" in the Pilot Program [8]. The average annual early intervention rate was 60.97%, and the average annual early follow-up rate was 70.94%, indicating that the utilization rate of preliminary cognitive screening services in the sample region is acceptable but still needs improvement.

Multiple factors affect the utilization rate of preliminary cognitive screening services. On the demand side, these include inadequate cognitive education

and popularization leading to lack of knowledge about dementia prevention and treatment among older adults (considering memory decline as normal aging and early dementia intervention as ineffective), lack of urgency for early dementia intervention (compared with other chronic diseases, the preclinical stage of dementia receives less attention due to limited impact on daily life), and resistance to dementia screening (stigma and social labeling). On the supply side, factors include heavy financial burdens, non-short-term or indirect benefits of early dementia screening, high professional requirements for preliminary cognitive screening services, lack of detailed diagnostic guidelines, absence of referral mechanisms, human resource shortages, short institutional construction time, and lack of economic incentives [17-19].

Additionally, all sample institutions provided preliminary cognitive screening services free of charge. Free screening services help attract older adults to participate, identify dementia risks early, and promote better health management awareness. They also help reduce individual medical service expenses and unnecessary outpatient costs, improving health welfare [20]. Regarding project funding, the Action Plan proposes clear subsidy standards, providing one-time construction subsidies of 400,000 yuan for community cognitive disorder service centers, with continued access to basic and performance subsidies for community home-based elderly care centers after establishment. This demonstrates national attention and strong support for the construction and operation of community cognitive disorder service centers. However, the survey showed that only 4 sample institutions received funding from government project subsidies, while 8 had to fully bear project costs themselves, indicating single-source funding and insufficient financial guarantees for preliminary cognitive screening services in the sample region. Multiple cooperation channels and expanded funding sources are needed.

3.4 Recommendations

3.4.1 Improve Cognitive Prevention and Control Mechanisms Nanjing currently follows a three-tier dementia prevention and control mechanism. Primary prevention involves community cognitive disorder service centers providing health education and early screening services for low-risk dementia groups to enhance brain health awareness and cognitive reserve while eliminating resistance to cognitive screening. Secondary prevention involves memory prevention and treatment centers or cognitive disorder disease diagnosis and treatment centers providing classified management and graded interventions for medium- and high-risk dementia groups to delay or even reverse disease progression. Tertiary prevention involves community cognitive disorder service centers and cognitive care institutions providing professional care and social support for families after dementia diagnosis to reduce family caregiving pressure. Enhanced linkage between prevention and control tiers is needed, with cognitive disorder centers at all levels maintaining vertical integration, improving referral systems between communities, primary and secondary hospitals, ensuring

implementation of continuous post-screening services, promoting the construction of cooperative institution networks for dementia, and improving cognitive prevention and control mechanisms.

3.4.2 Strengthen Cognitive Prevention and Control Guarantees First, funding guarantees should be enhanced. Relevant departments should expand financial subsidies based on institutional nature and preliminary cognitive screening service implementation, while community cognitive disorder service centers should seek multi-channel funding support, such as street-level project funding, donations from charitable organizations or enterprises.

Second, talent guarantees should be strengthened. Advanced cognitive disorder disease diagnosis and treatment centers and higher-level units should regularly hold continuing education courses on cognitive disorders and conduct targeted, standardized training for personnel at all levels and occupational categories to establish a professional talent system, address community human resource gaps, and provide standardized dementia screening and diagnostic services.

Third, knowledge guarantees should be enhanced. Dementia-related experts should strengthen collaboration to develop guidelines and local standards applicable to primary care institutions such as community cognitive disorder service centers, promote early identification of dementia, standardize screening standards and processes, and achieve efficient and high-quality preliminary cognitive screening.

Fourth, technical guarantees should be strengthened. Core advanced cognitive centers should enhance scientific research collaboration with universities to continuously promote the development, application, and advancement of new dementia technologies, promote digital cognitive screening and online self-assessment, and utilize information technology to establish digital brain health management systems for residents, breaking through spatial and human resource limitations to effectively improve the overall level of dementia prevention and treatment in China.

3.4.3 Enhance Social Support for Prevention and Control First, cognitive education efforts should be intensified to comprehensively improve older adults' awareness of dementia and related diagnosis and treatment institutions, mobilize their willingness to participate in dementia screening, and transform potential demand into active utilization.

Second, management efforts should be strengthened, with health and civil affairs departments refining dementia prevention and control policies and enhancing supervision of implementation at each center.

Third, community cognitive disorder service centers across districts should be linked to expand dementia-friendly service sites, train dementia-friendly teams including social workers and volunteers, and strengthen the construction of professional dementia service forces.

Fourth, multi-party cooperation should be enhanced. Clinical guidelines, government policies, funding arrangements, facilities, human resources, and infrastructure related to dementia must be coordinated to enable rapid and efficient implementation of preliminary cognitive screening services.

In recent years, the state has attached great importance to elderly dementia prevention and control, issuing a series of policies to continuously and pragmatically promote related work. Nanjing has actively responded and continuously implemented elderly dementia prevention and control work, clarifying center construction scales and cognitive screening and intervention service content while providing standardized subsidies. Nanjing' s preliminary cognitive screening service system has initially formed, and early dementia prevention and control have achieved certain results. However, due to being in the pilot stage, it still faces challenges such as non-standardized service systems, slow service implementation, and insufficient project guarantees. Further efforts are needed to improve cognitive prevention and control mechanisms, strengthen prevention and control guarantees, and enhance social support.

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Note: Figure translations are in progress. See original paper for figures.