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Progress in Research on Self-management of Frail Elderly Patients

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Abstract: *This paper reviews the related concepts, evaluation tools, intervention and application effects of self-management intervention for debilitated patients in order to provide reference for self-management intervention for debilitated patients in China, improve the treatment effect and promote the rehabilitation of patients.*

Keywords: *Frailty; Self-management*

Frailty is a state in which the individual's anti-stress ability decreases due to the decline of physiological reserve function and physical activity. Small outside can cause serious negative events such as falls, delirium, disability, acute attack of chronic diseases, and even death [1]. The proportion of the elderly population in China is about 20% in the world, ranking first in the world [2]. The sharp increase in the number of the elderly population has made the aging of the population a serious social problem in China at present [3]. By the end of 2018, there were 250 million people aged ≥ 60 in China, accounting for 17.9% of the total population [4]. Globally, the prevalence rate of debilitating elderly people is 13.6%, and the annual incidence rate is 4.34% [5]. Senile debilitating diseases lack typical symptoms and signs, so they are often ignored [6]. The risk of negative health outcomes caused by frailty [7] not only brings a burden to patients and their families, but also brings a huge burden to society [8]. In the past, medical care has focused on managing specific diseases rather than patients, which is not only expensive but also ineffective [9]. In recent years, more and more scholars began to explore the positive effects of self-management on alleviating frailty. Self-management refers to the effective management of symptoms caused by chronic pain, physical and mental impacts and life changes by individuals using their own abilities [10]. Grady & Gough [11] defines self-management as "the daily management of chronic diseases by individuals in diseases". The patient's own behavior has a great influence on the disease [12]. The improvement of self-management awareness and ability of elderly weak patients is helpful to the prevention and treatment of senile diseases and the improvement of life of the elderly [13-14]. Schuurman's [15] research shows that debilitating is closely related to the decline of self-management ability. A two-year longitudinal study conducted by Yuxiang Tamura in rural areas of Japan shows that strengthening the management of self-care for chronic diseases and disabilities, regular exercise and self-management skills may weaken the progress of elderly patients [16]. This article will review the assessment tools, self-management status, influencing factors and intervention status of self-management of elderly debilitated patients, in order to provide theoretical basis for in-depth study of self-management of elderly debilitated patients.

1. Assessment tools

1.1 Self-rated Prognostic Index (SELFY-MPI)

The multidimensional prognostic index (MPI) is a well-calibrated tool, which has good discrimination and accuracy for short-term and mortality in hospitals and communities [17]. MPI is different from the common tools for assessing the frailty of the elderly, and contains more comprehensive contents [18]. Alberto Pilotto developed self-managed MPI (SELFY-MPI) in 2019 [19]. The assessment tool includes eight areas: basic and instrumental activities of daily life, activity, memory, nutrition, complications, drug quantity and socio-economic status. Divide the sum of the calculated scores for the eight areas by 8 to give the final SELFY-MPI risk score, which ranges from 0 = no risk to 1 = high risk of death. The median time required to complete SELFY-MPI is 16 minutes (ranging from 9 to 36 minutes). The researchers applied it to 167 subjects and used Bland-Altman method to measure the consistency

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between MPI and SELFY-MPI. The mean values of MPI and SELFY-MPI were 0.147 and 0.145, respectively. The mean difference is +0.002 and ± difference is 0.07. SELFY-MPI has strong correlation and validity with MPI. Therefore, SELFY-MPI can theoretically be used as a prognostic tool for subjects of different ages. However, since this assessment tool has not been available for a long time, future research needs to verify whether SELFY-MPI has the same accuracy as MPI in predicting death and other negative results.

In addition, Alberto Cella developed a simplified version of the self-managed prognosis index (SELFY-MPI-SF) based on this assessment tool [20]. They share the following seven areas: basic and instrumental activities of daily life, mobility, memory, nutrition, complications, and drug quantity. The difference is that in SELFY-MPI-SF, the eighth field "cohabitation" (i.e. living alone, with family or living in residential facilities) has replaced socio-economic status. Bland-Altman method was also used to measure the consistency between the two assessment tools, and it was concluded that the consistency between SELFY-MPI and SELFY-MPI-SF was very good (k=0. 762; rho=0. 924, $p < 0.0001$). On average, it took about 7 minutes to complete SFES. Therefore, SELFY-MPI-SF has the advantage of shorter completion time than SELFY-MPI, and SELFY-MPI-SF may be an excellent tool for self-assessment of the frailty of the elderly living in the community.

1.2 Self-management Ability Scale for Elderly Patients (SMAS)

In 2005, Hanneke Schuurmans developed the self-management ability scale for elderly patients. His 30 items are composed of 6 subscales with 5 items. The overall internal consistency of the scale is 0.90 [21]. The average score of overall SMAS ranges from 5 to 30, and the higher the score, the higher the self-management ability.

2. Overview of self-management of elderly debilitated patients

Self-management ability is directly related to disease and life management ability [22], and also plays an intermediary role in the relationship between social, cognitive and physical functions and happiness [23]. People must learn to monitor their health behavior and what happens, and how to use similar goals to motivate themselves and guide their behavior [24].For patients, self-management includes three independent but related parts: medical or behavioral management of diseases, role management and emotional management [25] Self-management is different from medicine in that self-management takes patients as the center and pays attention to the stimulation of patients' self-efficacy At the same time, self-management interventions also take a variety of forms, including group meetings, self-management interventions based on internet and mHealth technology, and materials sent by mail or printed materials distributed in person for non-participation in group meetings or internet-based chronic disease self-management plans [26] .In the past, the most common form of intervention was face-to-face group meeting. Nowadays, in the Internet age, the medical big data information platform gradually covers and integrates with advanced digital information system tools to achieve efficient use of medical resources and optimize business processes to achieve the goal of "zero-distance medical service" [27] e-Health intervention is an inevitable trend of informationization [28] The rehabilitation part outside the medical service center specifically asks telemedicine, which should be manifested in two aspects: on the one hand, the "one-to-one" network consultation and return visit service, on the other hand, the remote guidance program has wide universality [29] .In 2020, Taicang City introduced an online health self-management team to innovate self-management in form. The online health self-management team increased the number of patients participating in disease self-management [30] Not only that, the online self-management form based on the Internet can also perform a certain level of online self-management support [31] .The research of Zhang Lulu [32] constructs a community "ecosystem" of community-virtual community-patient, and points out that the establishment of community as a link and the integration of real community and virtual community can strengthen the health management of chronic diseases in the community It can be seen that the Internet-based self-management can make the elderly patients at home more convenient to participate in self-management and make the medical staff better for the elderly patients at home to develop self-management plan for the correct guidance .

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3. Related factors affecting self-management of senile debilitated patients

3.1 Educational Factors

3.1.1 Level of education

The results of Jane M Cramm's study suggest that patients with higher education may find healthy aging and/or self-management of the effects of frailty easier than older people with lower education level [33] Lindsay's research on the reasons for this difference shows that people with less education often lack the necessary resources for effective self-management [34] Therefore, interventions need to be different when developing self-management plans for debilitated elderly people with different educational levels.

3.1.2 Health Literacy

Health literacy is also a related factor of self-management of elderly debilitated patients. Son YJ's research shows that health literacy is significantly related to debilitated and self-management behaviors [35]. Elderly people with low health literacy have poor self-management ability [36], and high health literacy often represents low frailty [37].

3.2 Psychological factors

3.2.1 Self-efficacy

Self-efficacy means that an individual has confidence in the ability to successfully complete or achieve a specific behavioral goal, which is the decisive factor of behavior and a strong predictor of individual changing healthy behavior [38]. Zhang Yuling's[39] research shows that the higher the self-efficacy of patients, the lower the degree of frailty The core of self-management is self-efficacy theory [40] .

3.2.2 Loneliness and depression

Life-related frailty is not only physical frailty but also psychological frailty [41]. Yang Yuying's[42] research found that loneliness is negatively correlated with self-management ability and positively correlated with frailty. In clinical practice, loneliness induction of weak patients is taken as a key evaluation index. On the basis of evaluation, measures suitable for patients are taken to reduce loneliness of patients, achieve the possibility of frailty and enhance self-management ability of patients Not only that, self-management ability and self-efficacy are also most closely related to social and emotional loneliness [23]. Therefore, loneliness has a significant impact on the self-management ability of elderly debilitated patients Studies have shown that self-management ability is closely related to depression [43]. Soysal's [44]research shows that there is an interactive relationship between depression and frailty in the elderly. It can be seen that the deepening of depression has a negative impact on the self-management ability of elderly debilitated patients It is an important and sexual strategy to combine the intervention of patients' depression with the care of caregivers [45].

3.3 Social Factors

3.3.1 Social Skills

Cramm JM's[23] research results show that the level of social cognition and physical function is closely related to self-management ability, which means that the elderly with low social cognition and physical function have worse self-management ability than the elderly with higher functional level. Social factors can also accelerate frailty and dysfunction[46]. Besides, social skills are also related to negative emotions Lower social skills can have a negative impact on one's mood, which in turn can lead to the ability to take care of one's health This lack of capacity may lead to further loss of social activities and resources, resulting in mutually reinforcing cycles Besides, social skills are also related to negative emotions Lower social skills can have a negative impact on one's mood, which in turn can lead to the ability to take care of one's health This lack of capacity may lead to further loss of social activities and resources, resulting in mutually reinforcing cycles [47]. Because both social skills and negative emotions have an impact on patients' debilitating and self-management ability, this cycle will inevitably become an unfavorable factor for patients' debilitating self-management ability. In addition to the impact on debilitating and self-managing abilities, lack of interpersonal relationships can also increase mortality. All in all, social relationships have a significant impact on adult health outcomes [48].

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4. Intervention study on self-management of senile debilitated patients

Intervention study on self-management of senile debilitated patients at present, there are few intervention forms, both online and offline intervention results are effective Yamada Yiru's[49] experiment in Kyoto, Japan shows that self-managed group exercise is very useful for the incidence of disability in the elderly. Minoru Yamada recruited adults who lived in 2012 in a city-independent community of 65 and older in Kyoto prefecture Participants in the participating group (n = 1620) attended 60-minute group training sessions once or twice every two weeks from December 2012 to December 2016 The outcome measure is the number of new LTCI requirements certified during the four-year follow-up During the four-year follow-up period, 247 participants (15.2%) in the participating group and 334 participants (20.6%) in the control group were certified for new LTCI service requirements The risk ratio of new LTCI service requirements in the participating group was 0.73 (95% CI = 0.62-0.86) over a four-year follow-up period compared to the control group, and the results showed that self-managed group exercise was useful for the incidence of disability in the elderly Therefore, self-management of group activities in each community should be encouraged. Sabrina Zora's[50] research suggests that chronic disease self-management programs may contribute to the self-perceived severity of debilitating conditions based on SELFY-MPI scores, especially among weaker subjects with more chronic diseases, lower cognitive performance and poorer nutritional status. Nicola Fairhall conducted a randomized controlled trial of 241 debilitating community seniors in Sydney, Australia. The experimental group received a 12-month multifactorial interdisciplinary intervention targeting identified debilitating components. This experiment shows that interdisciplinary development of home exercise management programs and guidance of patients to complete the program contents include exercise-related disabilities of the debilitating elderly [52]. All the above results tend to show that self-management is beneficial to the delay of senile frailty and the health of the elderly.

5. Summary and Outlook

To sum up, the self-management of senile debilitated patients has positive effect on improving the life of senile debilitated patients, delaying the progression of debilitated diseases and preventing complications. It is an effective intervention means to deal with senile debilitated diseases with the participation of doctors and patients. In specific clinical practice, we should start with debilitating screening, case identification and management of debilitating [52]. When developing a debilitating self-management plan, we should make it clear that debilitating is not just the field of geriatricians. Nursing plans for debilitating individuals should include professionals from a range of relevant medical professions[53]. Moreover, if the debilitating management plan is to really work, it is necessary to communicate well with the debilitating elderly when making the plan, fully consult them and formulate a self-management plan that conforms to the personal situation of the debilitating elderly patients Only in this way can patients cooperate [54]. Most of the related researches on debilitating self-management focus on the study of debilitating elderly patients at home and abroad, so it is necessary to further confirm the value and feasibility of self-management in delaying the debilitating elderly in China in future research. At the same time, more experiments on self-management intervention of senile debilitating patients are needed in the future, and more detailed self-management plans for different types of senile debilitating patients are formulated in order to provide more evidence-based practices for clinicians and decision makers.

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